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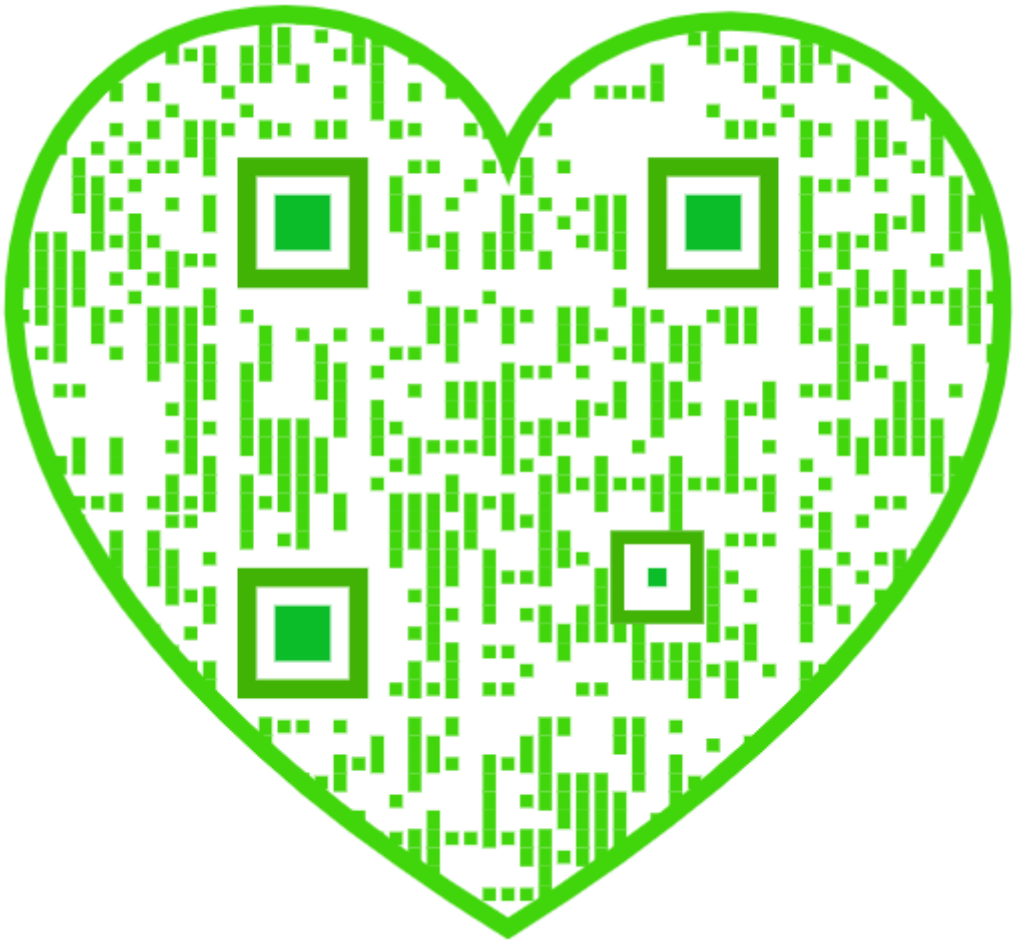

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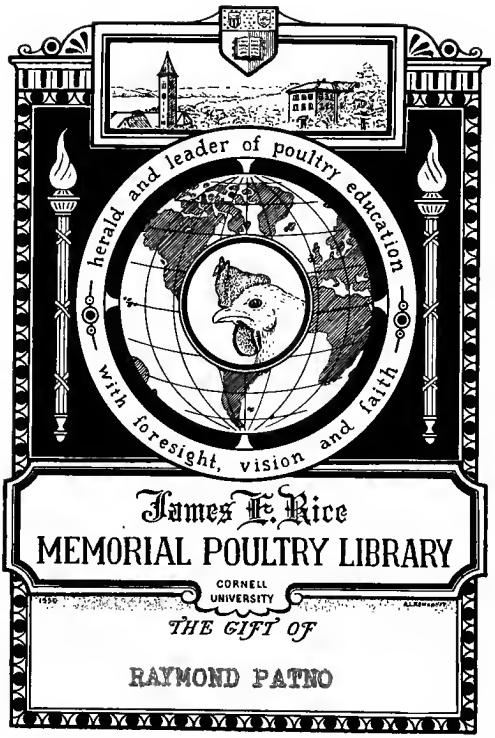

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CARRIER, FANTAIL, AND FANCY PIGEONS.

BEETON'S

BOOK OF POULTRY

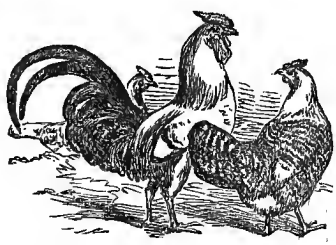
AND

DOMESTIC ANIMALS:

SHOWING

HOW TO REAR AND MANAGE THEM

IN SICKNESS AND IN HEALTH.



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PREFACE.

IT is an aphorism of Brillat Savarin, the intelligent writer on the pleasures of the palate, that in inviting a person to your house, his comfort and happiness are in your hands so long as he remains under your roof. No Englishman, unless he is undeserving of the hospitable character our nation possesses, will hesitate to indorse the Frenchman's precept, and carry out with all earnestness the duties of a generous host. The admission made, that we ought to care for the well-being of our equals who are with us as visitors only, and for a short space of time, it will easily be allowed that to the humbler creatures who are to pass their lives with us, we are bound to be so much the more attentive, kind, and indulgent. For no one, upon whose cranium the bump of benevolence asserts itself ever so modestly, will deny that we should be *at least* as watchful to supply the wants of the little chirping chicken, or the blind kitten, as to see that our human guest has his hot water and slippers at the proper moment.

Believing that an acquaintance with the characters of those you entertain is necessary to your fulfilling, with the happiest effect, your *devoir* as host or keeper, we have, in this volume, not contented ourselves with writing bare instructions as to the practical treatment of the moulting hen or distempered

dog. Whilst we have consulted our own experience, and searched the best authorities on the diseases of the animals we have described, we have at the same time given, so to speak, biographical sketches of our furred and feathered friends themselves, with a view of discovering to the keepers of "Pets" those peculiar instincts which have been noted as characteristic of the genera and species of those creatures which we include amongst our domestic animals. A knowledge of the nature of your pet may often enable you to *prevent* disease from visiting it, and lengthen the term of life of a faithful and endeared companion.

To provide clean and pleasant cottages for the poor is properly considered an object of great importance. Inferior, perhaps, but akin to that subject, is the consideration of the wise and fit manner to manage the houses and the feeding of the live stock of the hutch, the dormer, the bee house, the kennel, the beehive, the aquarium.

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PIGEONS.

STRUCTURE OF BIRDS IN RELATION TO THEIR FLIGHT.

It may not be out of place here to offer a few remarks on the wonderful mechanism which enables birds to wing their course so rapidly through the air. The feathers are so placed as to overlap each other, like the slates or the tiles on the roof of a house. They are also arranged from the fore-part backwards; by which the animals are enabled the more conveniently to cut their way through the air. Their bones are tubular or hollow, and extremely light compared with those of terrestrial animals. This greatly facilitates their rising from the earth, whilst their heads, being comparatively small, their bills shaped like a wedge, their bodies slender, sharp below, and round above,—all these present a union of conditions, favourable, in every way, to cutting a passage through the aërial element, to which they are considered as more peculiarly to belong. With all these conditions, however, birds could not fly without wings. These, therefore, are the instruments by which they have the power of rapid locomotion, and

are constructed in such a manner as to be capable of great expansion when struck in a downward direction. If we except, in this action, the slight hollow which takes place on the under-side, they become almost two planes. In order that the downward action may be accomplished to the necessary extent, the muscles which move the wings have been made exceedingly large; so large, indeed, that, in some instances, they have been estimated at not less than a sixth of the weight of the whole body. Therefore, when a bird is on the ground and intends to fly, it takes a leap, and immediately stretching its wings, strikes them out with great force. By this act these are brought into an oblique direction, being turned partly upwards and partly horizontally forwards. That part of the force which has the upward tendency is neutralized by the weight of the bird, whilst the horizontal force serves to carry it forward. The stroke being completed, it moves upon its wings, which, being contracted and having their edges turned upwards, obviate, in a great measure, the resistance of the air. When it is sufficiently elevated, it makes a second stroke downwards, and the impulse of the air again moves it forward. These successive strokes may be regarded as so many leaps taken in the air. When the bird desires to direct its course to the right or the left, it strikes strongly with the opposite wing, which impels it to the proper side. In the motions of the animal, too, the tail takes a prominent part, and acts like the rudder of a ship, except that, instead of sideways, it moves upwards and downwards. If the bird wishes to rise, it raises its tail; and if to fall, it depresses it; and, whilst in a horizontal position, it keeps it steady. There are few who have not observed a pigeon or a crow preserve, for some time, a horizontal flight without any apparent motion of the wings. This is accomplished by the bird having already acquired sufficient velocity, and its wings being parallel to the horizon, meeting with but small resistance from the atmosphere. If it begins to fall, it can easily steer itself upward by means of its tail, till the motion it had acquired is nearly spent, when it must be renewed by a few more strokes of the wings. On alighting, a bird expands its wings and tail fully against the air, as a ship, in tacking round, backs her sails, in order that they may meet with all the resistance possible.

"The anterior extremities of birds," says Macgillivray, "are modified so as to render them subservient to aërial progression. They are converted into wings by having appended to them a

series of long stiff feathers, variously proportioned, according to the kind of flight required by the species. This adaptation of the form and structure of birds to flying, or progression in the air, is obvious and intelligible. Their body is oval, with the larger end forwards, and the more powerful muscles placed on the breast, so that when the horizontal direction is assumed, the centre of gravity comes between the wings, and is kept near the lower part by the weight of the pectoral muscles. The length and flexibility of the neck enable the bird to make the necessary changes in the centre of gravity, while the solidity of the dorsal spine gives advantage to the action of the muscles; the head is terminated by a pointed bill, which aids in cleaving the air; the feet, when short, are drawn up and concealed under the feathers; when long, stretched out beneath or beyond the tail, which is more or less expanded, and helps to support the body in the air, as well as, by acting in the manner of a rudder, to change its direction, or, by being stretched out, to break its descent. In proportion to their bulk, birds are also much lighter than other vertebrate animals, and their lightness is produced by the introduction of air into their tissue, and even into the bones, as well as by the great bulk of the feathers, which, in those having a very buoyant flight, as owls and gulls, is much greater than that of the body.

"When a bird intends to fly, it loosens its wings from their ordinary position, throws its body forward, and gives it a sudden impulse by means of the legs, which would merely produce a leap, but the wings, being in the meantime spread out and elevated, they are again brought down with force, so that their points generally strike against the ground. Whether or not, they act as levers, and, by repeated strokes, carry the bird upwards. Were its ascent vertical, the rapid action of the wings in the same plane would suffice to raise it, provided the downward stroke were much more powerful than the upward, the wing, moreover, being drawn in during the latter, and stretched out during the former. But, for progression in a horizontal direction, it is necessary that the downward stroke should be modified by the elevation, in a certain degree, of the free extremities of the quills, and that the pinion should be pulled backwards. The best subject in which to study the motions of the wings during flight is one of the larger gulls, in which the wings being very long and the flight remarkably buoyant, and performed by slow beats, one may trace their

alternations with ease, provided he be near enough; the wings are never extended to their full length, the elbow-joint being always more or less bent, and the hand or pinion always inclined backwards."

Of a feather's lightness, we may form some idea, when we find that the largest quill of a golden eagle weighs only sixty-five grains, and that seven such quills barely turn the beam against a copper penny. The feathers of a common fowl, weighing more than two pounds, weigh only two ounces; and the whole of an owl's plumage weighs but one ounce and a half. "Meant, as they are," says Bishop Stanley, "some for covering and some for strength, we shall find them, on examination, very differently put together. The light downy part, when examined through a microscope, will be found to bear little resemblance to the flat part, or blade of the quill. If it were not so, a bird would scarcely be able to fly at all; for when the flat of the wing was pressed down, the air would pass through it, yielding little or no resistance. The fibres of the downy parts have, we see, little connection with each other; they have short and loose side shoots, just sufficient to meet them together when pressed close to the skin; whereas the side shoots of the quill-feather hook and grapple with one another, so as to make one firm and united surface. It is clear, that if water could soak into the soft feathery covering of a bird, every shower of rain would be the death of thousands; inasmuch as it would increase their weight considerably, and at the same time, by destroying the fine elastic nature of the feathers, entirely disable them from flying, and they must remain in a helpless state upon the ground, either to perish through hunger or become the prey to men or animals, who would catch them without trouble."

The air bones in young birds are described as being filled with marrow, which becomes gradually absorbed, to make room for the admission of air. This gradual expansion of the air-cells and absorption of the marrow can nowhere be observed so well as in young tame geese, when killed in different periods of the autumn and winter. The limits to the air-cells may be clearly seen without, from the transparency of the bony walls. From week to week the marrow disappears, and the air-vessels increase in size, till, towards the close of the season, they become transparent.

"To give some idea of the duration and continuity of motion in birds," says an English naturalist, "and likewise

of the proportion of time and space which their courses occupy, their swiftness has been often compared with that of quadrupeds in their great progressions, whether natural or forced. The stag, the reindeer, and the elk, can traverse forty leagues in a single day; the reindeer, harnessed to a sledge, can make a journey of thirty leagues, and can continue so for many days in succession; the camel can travel three hundred leagues in eight days; the horse, trained for the race, and chosen from among the lightest and most vigorous, can perform a league in six or seven minutes; but his speed soon relaxes, and he would be incapable of supporting a longer career with the spirit and celerity with which he set out. But the swiftness of birds is considerably greater than that of such animals. In less than three minutes we lose sight of a large bird; of a kite, for example, which proceeds horizontally, or an eagle, which flies vertically, and the diameter of whose extent on the wing is more than four feet. From this we may infer that the bird traverses more than a space of four thousand five hundred feet in a minute, and that he can fly twenty leagues in an hour. Pietro della Valle says, that in Persia the carrier pigeon makes greater way in one day than the swiftest human runner can in six."

FOREIGN PIGEONS.

The *Columbidæ*, or pigeon family, are distinguished from the poultry and the gallinaceous birds in general by the possession of certain peculiarities, of which the following may be said to be the chief:—Bill arched towards the tip, and with a convex swelling at the base, caused by a sort of gristly patch, which covers the nostrils, and which, in some species, is curiously developed. Again, nearly all the gallinaceous birds are polygamous, and lay a great number of eggs each time they incubate, which, in the temperate zones, is rarely more than twice a year, while the true pigeons lay only two eggs each time and incubate frequently during the year. Finally, in the gallinaceous birds, the hind toe is articulated on the tarsus higher than the others, and only touches the ground with its claws; whereas, the pigeons possess a posterior toe, upon the same plan as the anterior toe, touching the ground throughout its length in walking and embracing the perch when the bird is at roost.

The distribution of the pigeon family is very extensive; the

form recurring, indeed, almost all over the world, except within the frigid zones. We will open the list with the largest and most unpigeon-like of the tribe, the Crowned Goura Pigeon, found in the Indian archipelago and most of the Mollucca Islands. From head to tail, this bird measures nearly two and a half feet. Its beak, which is two inches long, is black, and its head surmounted by a large semicircular compressed crest of narrow straight feathers, of a delicate light blue colour. Light blue, or rather grey-blue, marks the under part of the bird's plumage. The feathers of the back, scapulars, and smaller wing-coverts, black at the base, and rich purple-brown at the tips; greater coverts of the same colour, but barred with white in the centre, so that, when the wings are closed, a single transverse band appears across them. It builds its nest in trees, lays two eggs, and feeds chiefly on berries and seeds. Its flesh is said to be of excellent flavour. Speaking of the splendid specimens of this bird to be seen in the Zoological Gardens, J. G. Wood says, "Their walk is quite of a royal character—stately and majestic, and well according with the beautiful feathered crown they wear on their heads. The crest seems to be always held expanded. They have a quaint habit of sunning themselves upon the hot pavement of their prison, by lying on one side, laying the head flat on the ground, tucking the lower wing over them, and spreading the other over their bodies, so as to form a very shallow tent, each quill feather being separated from its neighbour and radiating round the body. Sometimes the bird varies this attitude, by stretching the other wing to its full extent, and holding it from the ground at an angle of 20 degrees or so, as if to take advantage of every sunbeam and every waft of air. While lying in this unique attitude, it might easily pass, at a little distance, for a moss-covered stone, a heap of withered leaves, or a ragged tree-stump, with one broken branch projecting to the side."

They are easily tamed, and in the East Indies are frequently kept in the farmyard, among the ducks and geese. They have all the habits of the common little pigeon, and bill and coo like the most ordinary "runt." The cooing, however, is a trifle more violent than that of the English species. Indeed, M. Bougainville relates that his sailors were greatly alarmed on hearing it, for the first time, in the wild and unfrequented spots of some of the islands visited by him, apprehending that the mysterious sounds proceeded from tribes

of lurking savages lying in ambush, presently to fall on and devour them.

Although of smaller size, the Nicobar pigeon is equally curious, and worthy of description as the stately Goura, king of pigeons, by virtue of his crown as well as his bulk. The Nicobar is a native of the island of that name, as well as of the isles of Java and Sumatra. It is about fifteen inches in length, its beak about an inch and a quarter in length, and slightly bent downward at the tip. Its head is slaty blue, with a purplish cast, and adorning its neck and breast are a profusion of long pointed feathers, glowing with resplendent green, bronze, and slaty blue. These long feathers are much like the hackles of the game-cock; and as the light falls on them, their colours come and go, and glow with orange and copper colour and gorgeous purple in a way impossible to describe. The back of the bird, indeed the whole of its upper surface, is glowing green, with bronze and steel-blue reflections; the tail is short and square, and pure white. Authors differ about the habits of this bird. Some assert that its nest is placed on the ground, and that the female lays several eggs, the young running as soon as hatched; but Mr. Bennet, who saw some in an aviary at Macao, says that they were usually seen perched on trees, even upon the loftiest branches; and adds, that they build their rude nests and rear their young upon trees, similar to all the pigeon tribe.

We will next describe a beautiful member of this family, known by the somewhat singular title of Aromatic Vinago. It is an inhabitant of India, Java, and other adjacent islands. It is a bird of mild and timid disposition, and is generally seen in large companies, except during the period of reproduction, when they pair, and retire to the depths of the forest. The back of the aromatic vinago and a part of the lesser wing-coverts are of a rich brownish-red, "shot," as the modern term is, with purple; the forehead is of a bright siskin green, the crown greenish grey, the throat rich yellow, and the under parts faint green. The greater wing-coverts and secondary quills are greenish black, with a vivid yellow edging throughout their entire length; the tail is a blending of blue-grey and brown, and white and green. In Selby's description of this bird we read:—"This beautiful bird has brilliant red eyes, the feet are something like the parrot's, and it climbs in the same way as that bird. It is very difficult to find; for, although a flock is marked into a tree, yet its colour is so similar to the leaf of

the banyan (on the small red fig of which it feeds), that if a bird does not move you may look for many minutes before you see one, although there may be fifty in the tree."

There is a pigeon found in the Mollucca and Pacific Islands, which, though not of very splendid appearance, has attractions of a far more substantial nature. It is the Carunculated Ground Pigeon, or the "Oceanic Fruit Pigeon," as it is sometimes called. In size it about equals the common turtle, but is a bulkier bird. The base of the bill and forehead is covered with a naked red skin, and the chin bears a good-sized wattle, which turns upwards on each side towards the ears. The head, cheeks, neck, and breast, are of a purplish grey, and the remainder of the plumage dingy grey, margined with white.

In a natural history of birds, of some repute, we find the following singular notice of the ground pigeon:—"These birds inhabit the forests of the Molluccas, Celebes, Australia, and the Pacific islands. Their food consists of fruit and berries. That of the precious nutmeg, or rather of its soft covering, known to us by the name of mace, affords, at certain seasons, a favourable repast to some species; and upon this luxurious diet they become so loaded with fat, as frequently, when shot, to burst asunder when they fall to the ground. And here we may observe the remarkable provision nature has made for the propagation as well as dissemination of this valuable spice; for the nutmeg itself, which is generally swallowed with the whole of its pulpy covering, passes uninjured through the digestive organs of the birds, and is thus dispersed through the group of the Molluccas and other islands of the East. Indeed, from repeated experiments, it appears that an artificial preparation, analogous to that which it undergoes in its passage through the bird, is necessary to insure the growth and fertility of the nut; and it was not till after many unsuccessful attempts had been made, that a lixivium of lime, in which the nuts were steeped for a certain time, was found to have the wished-for effect, and to induce the germinating tendency."

The Topknot Pigeon is another of the handsome *Columbidæ*. It is a native of Southern and Eastern Australia, and is most plentifully found in the bushes of the Illawarra and Hunter rivers. It is about seventeen inches long, and, as its powerful feet and general structure betoken, is a tree dweller, and of the loftiest pretensions; for it is seldom or never seen to make its nest except in the topmost branches. Its prevailing colour is silver-grey; its eyes are orange colour, ringed with crimson;

the base of its bill is blue, and the tip red; its feet are purple. Its wings, which are long and powerful, are edged with black, and its tail has a broad black band crossing its centre, and the extremities of the feathers marked with the same colour. Its chief characteristic, however, is a curious crest that surmounts its head. The possession of an occipital crest is nothing uncommon; but this bird has, in addition, a forehead-crest, composed of long soft feathers, of a silver-grey colour, while the crest on the back of the head is russet.

The Bronze-wing Pigeon of Australia is another "foreigner" worthy of special mention. It is about fifteen inches long. In colour, the forehead is buff, the head is dark brown, changing to deep plum colour at the sides; the sides of the neck are grey, and there is a white waved line under the eye, and running partly down the chin; the upper surface is dark brown; the coverts are marked with bronze-green spots, and the tertiaries have a large oblong shining green spot, edged with buff; the two central feathers are brown, and the rest grey, banded with black near the tip; the breast is purple-brown, fading into grey on the abdomen; the eyes are reddish-brown, and the legs and feet crimson. The bronze-wing is a great water-drinker, and, by reason of this, is often of incalculable service to the Australian traveller, in showing the way to springs and water-holes. Mr. Gould says, "With a knowledge of the habits of this bird, the weary traveller may always perceive when he is in the vicinity of water; and, however arid the appearance of the country may be, if he observes the bronze-wing wending its way from all quarters to a given point, he may be certain to procure a supply of food and water. When rain has fallen in abundance, and the rivers and lagoons are filled, not only to the brim, but overflowing and spread over the surface of the surrounding country, the case is materially altered; then the bronze-wing and many other birds are not so easily procured, the abundant supply of the element so requisite to their existence rendering it no longer necessary that they should brave every danger in procuring it." The same clever and interesting author and naturalist relates, that in the droughty summer of 1839-40, when encamped at the northern extremity of the Brezi range, his tent was pitched near a sort of natural basin in the rock, and which still contained a scanty quantity of water from last season's rains; this water, the natives assured Mr. Gould, was the only supply for several miles round, and so the traveller speedily found; for in the evening, and despite

the presence of a body of men with their clamour and cooking-fires and undisguised hostile intentions, flocks of timid birds, including the bronze-wing, came boldly to the water, all their natural apprehensions blunted by torturing thirst.

The Magnificent Pigeon is deserving of his name. What do my readers think of a pigeon of the following description:—"In size it equals or rather surpasses the common ring-pigeon; the tail being longer in proportion. The bill, which is rather slender, has the soft or membranous part of a brownish orange; the horny top, which is yellowish white, is slightly arched, but hard and compressed. The head, the cheeks, and the upper part of the neck are of a fine pale bluish grey, which passes into pale green towards the lower part of the neck and back. The upper parts of the body are of a rich golden green, assuming various shades of intensity as viewed in different lights; the wing-coverts are spotted with rich king's yellow, forming an oblique bar across the wings. The quills and tail are of the richest shining green, changing in effect with every motion of the bird. From the chin downwards proceeds a streak of the finest aricula purple (the base of the feathers being of a deep sapphire green); this line gradually expands as it descends, and covers the whole breast and abdomen. The lower belly, thighs, and under wing-coverts are of the richest king's yellow. The feet are bluish black, the tarse short, and clothed with yellow feathers half way down their front and sides." The Magnificent pigeon is found only in Australia, where it lives in trees, and subsists on fruit and seeds.

We now come to a "foreigner" more resembling in shape, size, and colour that with which we are acquainted than any other—the Passenger-pigeon of North America. Throughout those regions it is enormously abundant, and is remarkable for its migration in immense flocks from one part of the United States to another. Their arrival at their roosting-places is eagerly watched for by the inhabitants, who anxiously look out for their coming; and no wonder, as the following account of the gathering of a "pigeon-crop," by Wilson, will show:—

"As soon as the young were fully grown, and before they left the nest, numerous parties of the inhabitants from all parts of the adjacent country came with waggons, axes, beds, and cooking utensils; many of them accompanied by the greater part of their families, and encamped for several days at this immense nursery. Several of them stated that the noise was

so great as to terrify their horses, and that it was difficult for any person to hear another speak without bawling in his ear. The ground was strewed with broken limbs of trees, eggs, and young squab pigeons, which had been precipitated from above, and on which herds of hogs were fattening. Hawks, buzzards, and eagles were sailing about and seizing the squabs from the nests at pleasure; while from twenty feet upward to the top of the trees the view through the woods presented a perpetual tumult of crowding and fluttering multitudes of pigeons, their wings roaring like thunder, mingled with the frequent crash of falling timber; for now the axemen were at work cutting down those trees that seemed to be most crowded with nests, and contriving to fell them in such a manner that in their descent they might bring down several others; by which means the falling of one large tree sometimes produced two hundred squabs little inferior in size to the old ones, and almost one heap of fat. On some single trees upwards of one hundred nests were found, each containing one squab only. It was dangerous to walk under these flying and fluttering millions, from the frequent fall of large branches, broken down by the weight of the multitudes above, and which in their descent often destroyed numbers of the birds themselves; whilst the clothes of those engaged in traversing the woods were completely covered with the excrements of the pigeons."

Audubon gives the following animated description of one of these nocturnal *battues*:—"The sun," he says, "was lost to our view, yet not a pigeon had arrived; but, suddenly, there burst forth a general cry of, 'Here they come!' The noise which they made, though yet distant, reminded me of a hard gale at sea passing through the rigging of a close-reefed vessel. As the birds arrived and passed over me, I felt a current of air that surprised me. Thousands were soon knocked down by the men provided with poles. The current of birds, however, kept still increasing. The fires were lighted, and a most magnificent, as well as a wonderful and terrifying sight, presented itself. The pigeons, coming in by thousands, alighted everywhere, one above another, until solid masses of them, resembling hanging swarms of bees, as large as hogsheads, were formed on every tree, in all directions. Here and there the perches gave way under the weight with a crash, and, falling to the ground, destroyed hundreds of birds beneath, forcing down the dense groups with which every stick was loaded. It was a scene of uproar and confusion. I found it quite useless

to speak, or even to shout, to those persons nearest me. The reports even of the nearest guns were seldom heard, and I knew only of the firing by seeing the shooters reloading. No person dared venture within the line of devastation; the hogs had been penned up in due time, the picking up of the dead and wounded being left for the next morning's employment. Still the pigeons were constantly coming, and it was past midnight before I perceived a decrease in the number of those that arrived. The uproar continued, however, the whole night; and, as I was anxious to know to what distance the sound reached, I sent off a man accustomed to perambulate the forest, who, returning two hours afterwards, informed me he had heard it distinctly when three miles from the spot." Towards daybreak, according to the same authority, the pigeons again move off, and various nocturnal beasts of prey are seen sneaking away from the ground, where they have found a plentiful and accessible meal; the human devastators then go in to collect their share of the plunder, and when they have selected all that they have occasion for, the hogs are let loose to feed upon the remainder.

"It is extremely interesting," says the above quoted authority, "to see flock after flock performing exactly the same evolutions which had been traced in the air, as it were, by a preceding flock. Thus, should a hawk have charged on a group at a certain spot, the angles, curves, and undulations that have been described by the birds in their efforts to escape from the dreaded talons of the plunderer, are undeviatingly followed by the next group that comes up."

The accounts of the prodigious numbers in which these pigeons assemble would be open to doubt were they not made by naturalists of the highest note. For instance, if less an authority than Wilson narrated the following it would certainly have been voted an "Americanism." "I passed for several miles through the same breeding place, where every tree was spotted with nests, the remains of those above described. In many instances, I counted upwards of ninety nests on a single tree; but the pigeons had abandoned this place for another, sixty or eighty miles off, toward Green River, where they were said at that time to be equally numerous. From the great numbers that were constantly passing over our heads to and from that quarter, I had no doubt of the truth of this statement. The mast had been chiefly consumed in Kentucky; and the pigeons every morning a little before

sunrise set out for the Indiana territory, the nearest part of which was about sixty miles distant. Many of these returned before ten o'clock, and the great body generally appeared on their return a little after noon. I had left the public road to visit the remains of the breeding-place near Shelbyville, and was traversing the woods with my gun on my way to Frankfort, when, about ten o'clock, the pigeons which I had observed flying the greater part of the morning northerly, began to return in such immense numbers as I never before had witnessed.

"Coming to an opening by the side of a creek called the Benson, where I had a more uninterrupted view, I was astonished at their appearance; they were flying with great steadiness and rapidity, at a height beyond gun-shot, in several strata deep, and so close together that, could shot have reached them, one discharge could not have failed of bringing down several individuals. From right to left, as far as the eye could reach, the breadth of this vast procession extended, seeming everywhere equally crowded. Curious to determine how long this appearance would continue, I took out my watch to note the time, and sat down to observe them. It was then half-past one; I sat for more than an hour, but, instead of a diminution of this prodigious procession, it seemed rather to increase both in numbers and rapidity; and anxious to reach Frankfort before night, I rose and went on. About four o'clock in the afternoon I crossed Kentucky river, at the town of Frankfort, at which time the living torrent above my head seemed as numerous and as extensive as ever. Long after this I observed them in large bodies, that continued to pass for six or eight minutes, and these again were followed by other detached bodies, all moving in the same south-east direction till after six in the evening. The great breadth of front which this mighty multitude preserved, would seem to intimate a corresponding breadth of their breeding-place, which, by several gentlemen, who had lately passed through part of it, was stated to me at several miles."

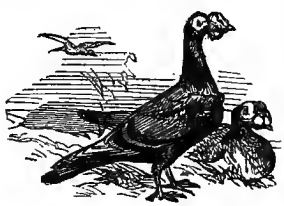
Wilson then enters into a rough calculation of the numbers of this mass, and he comes to the conclusion, that its whole length was 240 miles, and that the numbers composing it amounted to 2,230,272,000 pigeons, observing, that this is probably far below the actual amount. He adds, that allowing each pigeon to consume half a pint of food daily, the whole quantity would equal 17,424,000 bushels daily. Audubon confirms Wilson in

every point, excepting when he states that a single egg only is laid. Audubon insists, that the bird lays *two* eggs of a pure white, and that each brood generally consists of a male and female.

DOMESTIC PIGEONS.

THE CARRIER.

The carrier pigeon occupies, as he ought, the highest place among the domestic *columbidæ*. With the exception, perhaps, of the "blue rock," or, more properly, the dove-house pigeon, no domestic fowl can be traced to such antiquity. Long before Rome became a mighty city the carrier was a "home pet;" and at the celebration of the Olympian games this bird was frequently employed to carry to distant parts the names of the victors.



CARRIER PIGEON.

During the "Holy War," when Acre was besieged by King Richard, Saladin habitually corresponded with the besieged by means of carrier pigeons. A shaft from an English crossbow, however, happened to bring one of these feathered messengers to the ground, and the stratagem being discovered and the designs of the mighty pagan monarch revealed, the tables were turned and Acre was in the hands of the besiegers before the wily Saladin dreamed of such a thing.

The carrier is rather larger than the general run of pigeons. Most writers consider them as descendants from the Persian or Turkish variety. Their form is, however, much altered from those birds, and it is believed to be owing to an admixture with the Egyptian variety known as Bagdads, Scandaroons, or Horsemen, and from which cross they, in all probability, obtain the long beak considered so great a point in this breed, while the true Turkish or Persian is not remarkable for the length of this member; that the Turkish and Egyptian varieties have been much confused; and that from their mixture, with careful breeding, this breed has been produced, there can be little doubt.

To be thorough-bred the carrier should possess the "twelve

points," as it is termed, viz., three of the head, three of the beak, three of the wattle, and three of the eye. The head should be long and straight, and flat on the top; the beak should be straight, and long, and thick; the wattle should be broad at the base, short from the head to the bill, and leaning forward; and the eye should be large, and round, and uniform. A bird possessing all these qualifications, and being only of one colour, and that dark blue, may be esteemed a first-class bird, that is, taking a "fancier's" view of the subject. Dun-coloured birds, "cinnamons," are the least valued, though, without doubt, they possess as much sagacity and power of flight as any. Firmness of feather is an unerring sign of a good constitution, and a long wing of speed and endurance. As the carrier grows old he loses his lithe, active appearance, and his wattle increases in bulk. By these tokens you may judge of a bird's age. Their genuine plumage is black, and the feathers set remarkably close to the body. These blacks occasionally throw a dun, which duns are thought generally to have the best heads. Other colours are sometimes to be met with, but are rarely so good, and have almost invariably the great blemish of black eyes. They should be trained while young, and afterwards kept in exercise, or they become fat and idle, and their organ of "locality," or whatever it may be that enables them so marvellously to track their way, becomes weakened from want of use. They are shy, rather unfriendly birds, and excellent breeders and nurses, if kept in a natural state, but if allowed to become too fat they are less careful of their offspring.

The way of sending a despatch, or attaching the letter, is simply to write that which it is desired to communicate on a small piece of light paper,—say about three or four inches square. This is rolled up about the size of a goose-quill, and laid between two of the tail feathers, where it is secured by means of a piece of fine binding wire, which is pushed into one or both the shafts of the feathers. Their vanes are then wrapped about the paper by twisting the wire round and round, so that the pigeon carries it without being in the least inconvenienced in its flight. Some persons, I believe, wind the paper round the shank of the foot, or leg, and fasten it with worsted.

The Belgians have always been remarkable for their fondness of pigeon sports. It is recorded that in the year 1825, "The Society of Amateurs," at Antwerp, sent ninety carriers

to fly for a prize. They were started from the French capital at seven o'clock in the morning, and by noon of the same day thirteen of them had reached home. The first arrived at half-past eleven o'clock.

The true Antwerp carrier is comparatively a rare bird. It is not supposed to be indigenous to the country where it is found, but to be simply the descendant of tame pigeons who have lost their homes, and betaking themselves to such secluded and airy sites as the ancient towers and steeples the city of Antwerp affords, have there increased and multiplied. The size of the Antwerp carrier is nearly that of our familiar blue rock; its plumage is mostly mealy, with bright brown bars across the wings, and the neck of a reddish tint. The beak is slender and dove-shaped; the eye full and glittering, like two pink-tinted pearls. The forehead is rather full and round.

As already mentioned, this bird is seldom met with. Says Mr. Brent, "so choice are the few persons that keep them that they rarely can be induced to part with them, and so wild and restless are the birds in a strange place that it would be a rare occurrence for them to breed there; their wild nature and the indomitable desire to return to their native home cause them to be ever on the alert to escape; and should they be confined securely for a year, or even more, they will frequently at the expiration of that time, from their shy, restless disposition, be found willing and capable of returning to their old abode, though the journey may be one or two hundred miles."

The Liege, or "short-faced Antwerp," although not quite so clever as his cousin, who owns the proud title of "the true," is more desirable, inasmuch as it will sooner get reconciled to a new home. It is supposed to be a cross between the owl and the turbit, two sorts of pigeon very common in the Low Countries, where the Liege is more prevalent than elsewhere. It is very sober in plumage, chiefly whole coloured, mealy blue, or blue chequered. In July, 1828, fifty-six carriers, brought to London from Liege, were flown in the neighbourhood of Aldersgate-street, at thirty-four minutes past four o'clock, a.m. One of them reached its destination, a distance of about three hundred miles, at twenty-four minutes past ten o'clock the same morning, having thus accomplished its journey in five hours and fifty minutes. The other pigeons followed in succession, and all of them reached Liege at noon. In July, 1829, in a flight "against time," forty-one birds were loosed at

Maestricht, and to show what speed was expected of the little aërial travellers, the foremost one lost, although its speed had averaged more than forty-five miles an hour.

Among other given purposes for which this bird of speedy flight has been used, is that of assisting in the capture of smugglers. Captain Gouland who, some years ago, was wonderfully successful in arresting the contrabandists trading in the vicinity of Dover, kept a large flight, and had agents on the continent, who despatched his birds with the intelligence when cargoes of contraband goods might be expected. This having been practised for some time, the smugglers procured hawks to kill the pigeons when let off, thus destroying many of the captain's winged scouts.

"The carrier pigeon fancy," says good "old English" Mowbray, writing thirty years ago, "has never since been so prevalent in this country as it was sixty years ago. Men's minds have assumed a direction entirely opposite to that of sportive amusements; political reform and the redress of ancient grievances are now the popular substitute for pigeon flying." It is, of course, like my impertinence to question the sentiments of a writer who so wrote about the period of my weaning; but, with all due respect to Mr. Mowbray, I must think that reform and the redress of national grievances is no mean substitute for pigeon flying. My advice to the amateur pigeon-keeper is, that he had better take to politics or even worse, than meddle with "carriers." Be careful in your dealings with the "swift messenger," or even with his immediate cross-bred progeny. Carriers are not the most prolific breeders, and certainly not the most affectionate parents. They will frequently turn their eggs out of the nest, or wantonly break them, rather than be troubled with the cares of hatching. If, however, the amateur is bent on keeping carriers, the best course he can pursue is, first to discover that *rara avis*, a trustworthy bird-dealer, and then to purchase of him some newly-laid carrier's eggs. These he may place under a she "dragon," who, belying her name, is the most careful of pigeon-mothers. By all means avoid the purchase of *old* carriers; he who is so rash may depend he has seen the last of them the very first time he lets them loose.

I have a valuable bit of advice to give respecting breeding generally, and it may as well be given here as elsewhere. *Never breed "in and in."* That is, never attempt to stock your dormer from a single pair. If you do attempt it, the

result will be a race of weak, pigmy birds, always ailing, and not worth the food they consume. There is really no reason why you should, as any pigeon keeper will exchange equals of the same breed with you.

THE DOVE-HOUSE PIGEON.

This is the commonest of all the varieties of pigeon, and is widely spread through this country, as well as in other parts of Europe and Asia. They are often found in a state of nature, haunting rocks and cliffs like the blue rock, and are mistaken for that pigeon, but their difference in plumage and greater susceptibility of domestication mark them as distinct.

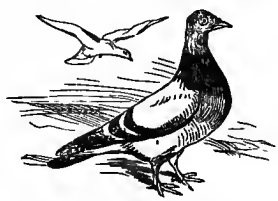
The dove-house pigeon is the sort most usually used for shooting-matches, and are better known to cockney sportsmen as "blue rocks," "duffers," and "rockies." They are too well known, however, to require a minute description. They may be taken as the standard size of pigeons generally, most of the same kinds being rather larger. Their beaks are thin, dark horn coloured, and dove shaped; their eyes gravelly red; the feet smooth, scaled, and deep red coloured, though the young ones have the scales of the feet of a blackish shade. The general colour of their plumage is a blackish slate colour, the greater wing coverts being tipped with bluish slate, so as to give them the mottled aspect from which they derive their name. The necks are glossed with green and purple reflections, the rump slate coloured, the tail barred with black, the external feather on each side has a bluish white mark on the outer web.

They are very prolific, and will rear, if well cared for, as many as eight, and even ten, broods in the year. If the young are brought up by hand they can be made exceedingly tame With the exception of the tumbler, no kind is capable of being made so docile. In an untutored state, moreover, they are exceedingly wild and shy, which, combined with their quickness and great power of wing, causes them to be favourites with pigeon-shooters.

"Although, if much disturbed in their lodging," says a modern pigeon authority, "or their abode becomes uncomfortable from some other cause, they will occasionally desert it (but such occurrences are rare), these houseless pigeons frequently join a neighbouring dovecot, where they feel more at ease; or, joined by any pigeons that may have lost their home (probably some brought from a distance, and let out by some inexperienced pigeon-keeper before they have become acquainted

with their new dwelling), they betake themselves to some ruin, tower, or steeple, or even to the eaves and cornices of some public building, where birds of this description may frequently be met with; or, in mountainous districts, they will betake themselves to the rocks, and join any colony of wild birds that may happen to be there. Although a naturally timid bird, the dove-house pigeon does not, like the blue rock, shun the abode of man."

Respecting the theory that the entire family of British pigeons claim as their progenitors the dove-house pigeon, the same authority observes:—"I believe that the blue rock is a distinct species from the dove-house. I have not, however, had any opportunity of trying to what extent the two will breed together, or if their produce would be productive *inter se*, as I have never been able to procure the blue rock pigeon in all its purity; but its wild unreclaimable nature, and its shunning so completely the abodes or neighbourhood of man, lead me to suspect that such is the case.



BLUE ROCK PIGEON.

"The dove-house pigeon is, on the other hand, a bird eminently susceptible of domestication—is everywhere found in that state; and a great many of the varieties of toys, or the lower class fancy pigeons, are evidently of this sort, little or nothing changed except in the colour of their plumage, while many others appear to be derived from the same source, but crossed with the other fancy kinds, or showing, more or less, the effect of careful breeding and selection. Thus far I am willing to admit of their descent from one original stock, viz., the chequered dove-house pigeon, *Columba agrestis*—*Columba affinis* of some. But when we come to examine the varied forms and distinct properties of many of the higher class fancy pigeons, I feel a great disinclination to assign them one common origin; nor do I think that even the admission of the blue rock (supposing that pigeon will produce fertile offspring with the dove-house pigeon) is sufficient to account for the many varied and marked peculiarities, or that domestication could so alter the form, and even nature, of the different breeds which continue to present the same peculiarities through so many generations. Of course, I do not deny the possibility

of such a thing, but I think it very improbable, and I cannot divest my mind of the idea, that at least some of the so-called varieties are something more. I allude to the wattled pigeons, the fantails, the trumpeters, the jacobins, the croppers, and the tumblers. These birds have all certain peculiarities by which they may be known and distinguished, under whatever circumstances of form or colour they may be bred. These properties are fixed, and do not appear among other varieties; nor are they liable to be lost, unless cross-breeding is resorted to. Neither have I ever heard of their appearing suddenly, or from any particular plan of breeding, which we might expect if they were, as some suppose, owing to taking advantage of some freak of nature or accidental malformation. I should incline to the belief that the various fancy pigeons owe their origin, not to one particular stock, but to the domestication and mingling of some five or six varieties, or nearly-allied species. These original families have long since become lost and obliterated, while from their mixture our present numerous varieties arise, the result of long domestication, and careful selection and breeding."

THE TUMBLER PIGEON.

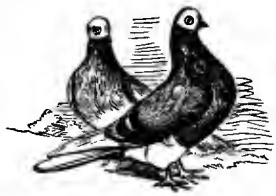
This aërial acrobat is one of the most favoured of the pigeon tribes. He deserves to be. Whether spinning about among the clouds, turning back summersaults, unsurpassed for neatness by anything ever attempted in that line at Astley's, or sitting at hand, his plump little body firmly set on his sturdy little legs, and his intelligent-looking head well set on his handsome neck, a more desirable pigeon cannot be found. Moreover, they are among the most prolific of their kind.

There are several varieties of the tumbler breed: the old English tumbler, the German feather-footed breed, the common flying tumbler, and several others. The old English variety is nearly extinct. They are smaller than the ordinary sort, with short beaks and round heads, and are extremely high flyers. The ordinary colour of this breed is blue. The German feather-footed are large, handsome birds, and good breeders. The general plumage of these birds is black, while the feather festoons about their feet (slippers they are called) are white.

"I once," says an experienced pigeon fancier, "kept a considerable flight of them, and can speak from experience that, notwithstanding their size, they would soar and tumble as well as the English birds; but, though they flew lightly

and remained long up, yet their flight is not swift, and consequently they are frequently taken by hawks. They are most remarkable for the quantity and length of feathers on the feet. I have had some with feathers six inches long, which stuck out almost like a small pair of wings when the birds flew."

The variety best known, however, is the common flying tumbler; and of the sub-varieties of this kind there is scarcely a colour common to the domestic pigeon that may not be found among the "common fliers." Of the "whole" coloured ones, there are blacks, blues, checquers, silvers, duns, kites, reds, yellows, buffs, drabs, ash-colours, and mealys. There is a white sort, but these are rare. In the mixed coloured birds, however, nearly all of them show some of the rare plumage. These variegated birds are variously known. A mottled is a whole-coloured pigeon, barring white feathers sprinkled over the head, neck, and shoulders; and according to the colour, so is it called a black, red, or mealy mottled. A gay mottle is one that reverses this order, except in tail and flight, which must be dark; the remainder of the plumage white, with a few dark feathers interspersed. These, when regularly mottled, are sometimes called ermine tumblers. A grizzle is one in which in each feather is a mixture of white with some other colour, and is termed a blue grizzle or black grizzle, according to the "ground." Red grizzle and strawberry are synonymous. A haggle is a bird whose colours are between those of a mottle and a grizzle. A splashed is something similar—between a mottled and a pied. A pied is a pigeon whose colour is divided into patches, which give rise to distinctive names. There is the beard pied, or blue-beard, or black-beard, &c., according to the ground colour.



TUMBLER PIGEONS.

"To be accurate in marking, the under mandible should be light, with a white patch under the beak, reaching from the corners of the mouth to the eyes, and being nearly a finger's breadth under the bill, and gradually dwindling to a point at the eyes, so as to give the appearance of a white beard, from which the name is derived. From seven to ten extreme pinion or flight feathers must be white on each side, as also the whole tail, upper and under tail coverts, and the feathers

on the rump, vent, and thighs, the rest of the body being of one colour; blues and silvers, however, having black bars on their wings. On the accuracy and evenness of their marking does their proportionate value consist. If dark feathers occur on the thighs, they are termed foul-thighed. If too much white down the neck, it is said to be slobbered.

"The piebald, or bald-headed tumbler, called for shortness a baldpate, resembles the preceding except the head, which is all white. The line passes a little below the beak and eye, and must be straight and even all round the head, when it is said to be clean cut; if otherwise, slobbered or foul-headed, and accordingly depreciated in value. Flight, tail, rump, vent, and thighs, white, like the beards. Both must have clear pearl eyes. Indeed, this is essential for all tumblers."

One of the most favourite among the "short-faced" tumblers is the "almond." To be perfect it should be tri-coloured, yellow, black, and white, every feather partaking of the three tints. Yellow, however, should predominate. If you are desirous of founding a breed of almond tumblers, you must match a black with a yellow bird, and they should be as near four years old as possible, as then they are in their prime.

If it is your intention to purchase almond tumblers in their squeakerhood, your best plan will be first to see the squeakers' parents, and let their appearance guide your purchase, as little can be judged from the squeakers' plumage previous to its first moult. You will find it murky and dingy as unpolished gold, and indeed it is not till the bird has reached his third year that he attains his true colours. As a rule, if the parents are perfect in colour, you may venture to purchase the progeny.

For my part, however, I see little sense in breeding birds as fantastically coloured as parrots, whose proper province is the clear blue heavens. Where is the use of it? What becomes of the pretty colour it has cost you so much time and patience to cultivate when the birds are properly disporting half a mile above your head? They are simply clay-coloured. A flock of "silvers," or "magpies" even, look ten times as handsome. It only becomes worth while to breed variegated pigeons when you possess sufficient cruelty to immure them in cages, like canaries, and keep them for exhibition. Besides, the artificial colouring won't stand. As the bird grows old, Nature asserts her right, the gay plumage gradually fades, the yellow blends with the black, and becomes dirty grey, and finally the over-

taxed feathers assume the natural black or cinnamon, and the handsome "almond" becomes a common "kite."

Therefore, good reader, set not your heart on "perfect almonds." If you want variety, match blacks with cream-colour, and breed magpies; or cinnamon with black, and produce cinnamon-splash. Let your first aim, however, be to procure well-shaped birds. The breast should be full, the body short, the neck slender, the eye pearly, and the beak as straight as a goldfinch's.

Tumblers are specially addicted to making a loud clapping noise with their wings on rising into the air; indeed, the better "clappers" they are, the better they are liked. There is little doubt that this peculiarity earned for this pigeon the ancient appellation of Smiter. Speaking of them, quaint old Willughby says:—"I take these to be those which the forementioned Hollander told Aldrovandus that his countrymen called Draiiers. These do not only shake their wings as they fly, but also, flying round about in a ring, especially over their females, clap them so strongly, that they make a greater sound than two battledores or other boards struck one against another. Whence it comes to pass that their quill-feathers are almost wholly broken and shattered, and sometimes so bad that they cannot fly." Smiters, or something very like them, must have been known and kept so long back even as Pliny's time; for we find him writing about some variety of pigeon as follows:—"You would think they were conscious of their own colours, and the variety with which they are disposed; nay, they even attempt to make their flight a means of clapping in the air, and tracing various courses in it. By which ostentation they are betrayed to the power of the hawk, as if bound, their feathers being entangled in the action of making the noise, which is produced only by the actual shoulders of their wings."

Never let your tumbler fly with other pigeons. They will not be able to fly near so high as he, and he, being a sociable bird, will descend and fly with them for the sake of company; consequently his flight will be spoiled. A well-behaved bird never tumbles, except while ascending or when coming down to pitch. You may judge of the health of your birds by their aërial performance. If the bird is not perfectly well, he will not tumble at all.

To break in young tumblers to a good flight, they should be let out as soon after sunrise as possible, in company of two or

three experienced birds, and very curious it is to see the young novices endeavouring to imitate the manœuvres of their elders. Let them stay out for a couple of hours, and then recall them by strewing their board (which, as before mentioned, must be painted a bright white) with canary-seed. Never let them out on foggy or very windy days, as they are very apt to lose themselves under such circumstances.

Respecting "short-faced" tumblers, a variety high in favour with fanciers, no more need be said, than that it matters little what their colour may be, so that, like a satisfied Chartist, they possess the "five points." These points are, one of the eye, one of the beak, one of the head, one of feather, and one of carriage. The *head* should be round, broad, and high; that is to say, having a full forehead, rising abruptly, and rather overhanging the beak, so as to form an acute angle where the head and beak join, or, as the fanciers say, have a good stop.

Fanciers resort occasionally to the shameful practice of breaking the beak or nose, when young, to improve the "stop;" but this often gives the birds an up-beaked appearance.

The wattle must be very fine and narrow, so as to leave but little space between the beak and the feathers of the head, which should show a sudden rise from the base of the beak.

The *beak* should not exceed five-eighths of an inch, measured from the iris of the eye to the end of the quick of the beak, but the shorter the better, straight, and fine, and it has been compared to that of a goldfinch. Paring or cutting the beak is resorted to by some dishonest persons; but it is generally easily to be detected by practised eyes, and spoils the appearance. If the young are reared by too coarse nurses, they often have their backs wrenched or twisted, which makes them unsightly or parrot-beaked. The *eye* should be of a bright clear pearly white, the fuller and more prominent the better; and there must be no naked skin or cere round it. In the best-headed birds the eye often appears rather below the centre of the head. A broken or muddy eye spoils the prettiest face.

The form of the bird should be small and compact, short thin neck, full chest, short back, tail and pinion feathers also short, and feet small, the carriage mincing, or, as it is vulgarly but expressively termed, "gingerly," head well thrown back, neck curved, chest up, pinions sweeping below the tail, the bird

strutting on its toes as if it were walking tiptoe to make the most of itself.

As regards feather, the same rules apply to the short-faced as to the other sorts. For the following directions as to the way in which a "flight" of tumblers should be trained, we are indebted to Mr. B. P. Brent, published by that gentleman in his admirable little "pigeon-book":—

"Procure, if possible, a few high-flying birds, to train the young ones to rise high when out. This is of much importance, and will save much trouble. The flying tumblers should be kept in a roomy loft by themselves. A trap, or area, as I have before described, is indispensable, in order to manage the pigeons successfully. Once a day they should be turned out to fly; the fore part of the day is the best, as, when the sun shines too hot, they do not fly so willingly. When in practice, they will mount at once high into the sky, occasionally clapping their wings, and turning over backwards till they rise to their full height or "pitch," often going quite out of sight, but keeping pretty much over their abode. They will thus continue on the wing for two or three hours; when they begin to descend, they tumble very much. When down they should be enticed in, and kept confined for the rest of the day, and not allowed to loiter about outside, or associate with other pigeons. Their loft should be made as comfortable as possible, and be provided with everything they require,—such as clean water, a bath, the well-filled hopper, a salt-cat, grits, green food, and materials for nesting, so as to prevent any desire to roam about, when out, to obtain these enjoyments; if not, it will soon be found that, instead of flying off at once, and mounting high in the air, they will make for some roof, or other spot, where they can find that for which they are longing; therefore, it is of great importance to remove any temptation, by supplying all their wants in their own loft. By this means, they will at once soar when let out, though, perhaps, at first it may be necessary to drive them up, by waving a flag, or otherwise frightening them. A few used to high-flying assist much in teaching the young ones, as they become strong on the wing, to soar; but it is very difficult, or almost impossible, to teach those that have long been accustomed to fly about at random, to fly high regularly. The best way to proceed with such is, after they are accustomed to the place, to send them off by a servant to the distance of half a mile or so, while the others are out; they will then most likely rise very high and join

them. By continuing this for some weeks, they will get accustomed to fly. Any that are determined not to rise need not be let out with the flight, or even at all.

"When in full practice, they will start off from the trap directly it is opened; and, after rising high, and flying a good time, according to the state of the air, will descend and sit on the roof, gradually going in through tipping holes and bolt-wires, as the trap ought to be closed, and not opened till the next day."

Should your tumblers be troubled with scouring, give them whole rice, mixed with their ordinary food; or should the scouring be obstinate, give them a pill three times a day, composed of powdered chalk kneaded with syrup of poppies.

THE POUTER.

This is also a very favourite pigeon, and, without doubt, the most curious of his species. He is a tall, strong bird, as he had need be, to carry about his great inflated crop, frequently as large and as round as a middling-sized turnip. A perfect pouter seen on a windy day is certainly a ludicrous sight. His feathered legs have the appearance of white trousers; his tapering tail looks like a swallow-tail coat; his head is entirely concealed by his immense windy protruberance, and altogether he reminds you of a little "swell" of a past century, staggering under a bale of linen.

A great pigeon authority says of the pouter, that to be reckoned a handsome bird, it should possess the following qualifications:—

"His tail should be spread out, and not touch the ground, nor droop close to or between his legs, and, above all, he must not rest upon his rump, which is called rumping, and a very great fault. The shoulders of his wings should be kept close to his body, and rather high up towards his neck; he should also show the lower ends of the winge removed from the tail, and keep his feet near together, walking chiefly on his toes. He should measure eighteen inches from the point of the beak to the tip of the tail, and the body of the bird should slope off taper from the shoulders. The yellow-pied pouter should be marked as follows:—The front and higher part of the crop should be white, encircled with a shining green, mixed with the colours with which he is pied, but the white should not reach the back of the head, for then he is called "ring-headed," there being a patch, in the shape of a half-moon, falling upon

the side of the neck of the same colour with which he is pied; when this is wanting, he is called swallow-throated. The head, neck, back, and tail, should be uniform. A blue-pied pigeon should have two black streaks or bars, near the end of both wings; if these be of a brown colour, the bird is not worth nearly as much, and he is termed kite-barred. When the pinion of the wing is speckled with white, in the form of a rose, it is called a rose-pinion, and is highly esteemed; when the pinion has a large dash of white on the outer edge of the wing, he is said to be bishoped, or lawn-sleeved. They should not be naked about the thighs nor spindle-shanked, but the legs and thighs ought to be stout, straight, and well covered with white, soft, downy feathers; if the feathers of these parts be of any other colour, the bird is much less valuable. The nine larger wing-feathers ought also to be white; if not, he is called foul-flighted; and if only some of them are white, he is called sword-flighted."

POUTER PIGEON.

The pouter is not a prolific breeder, is a bad nurse, and more likely to degenerate, if not repeatedly crossed and recrossed with fresh stock, than any other pigeon; nevertheless, it is a useful bird to keep, especially if you are founding a new colony, as it is much attached to its home, and little apt to stray; consequently, it is calculated to induce more restless birds to settle down, and make themselves comfortable. If you wish to breed pouters, you cannot do worse than entrust them with their own eggs. They should be set under a dragon; but you must be sure to supply the hen-pouter with other eggs, or she will go on repeatedly laying, and so weaken her constitution as to kill herself in a very short time.

The most common pouters are the blues, buffs, and whites, or an intermixture of all these various colours. I never saw the experiment tried, but it is asserted, on good authority, that if you pair a chestnut-coloured cock with a blue hen, the result will be a chestnut hen and a blue cock; and if this couple are again paired, the progeny will each take the colour of their respective grand-parents.

If the pouter is kept too long from grain, the chances are that, the first time he has the opportunity, he will so gorge his crop with it that some will mildew and decay before he has

time to consume it. If this state of things is not altered, the greedy pouter will certainly die. The following, however, is an old-fashioned and good remedy :—

Put the bird, feet downwards, into a worsted stocking, and stroke the crop *upwards*. Then hang up the stocking, and do no more than supply the imprisoned pouter with water, in moderation, till he has digested the contents of his crop. When you release them, however, don't give them their liberty, or their empty bellies may tempt them to surfeit themselves again. Put them under a coop, and feed them for two or three days sparingly.

The hen-pouter has not so extensive a crop as the cock, nor is she so upright in her gait. A certain sign of the pouter's being out of health is the hanging of his crop, like an empty bag. It is customary to keep them separate during the most severe winter months. The apartment devoted to each bird should be at least two feet high, else the bird will contract an ugly habit of stooping.

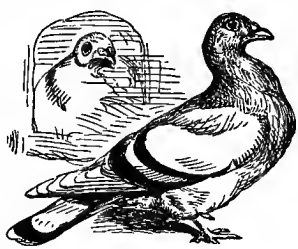
As one of the greatest defects a pouter can possess is inability to control his inflated crop, it may be as well, before you purchase an old bird, to see the wind-bag filled, and to observe how the bird then behaves. This the bird-dealer will do for you, or if you like you can do it yourself. Take the pigeon in your hands, and hold his wings to his sides; then take his beak into your mouth, and blow gently. So far from objecting to the operation, the pouter will enjoy it, and close his eyes in a satisfied manner while his crop is puffed out for him like a balloon. Then stand him on the ground; if he walks steadily, and evinces no disposition to totter while the crop remains fully distended, you may safely buy the bird, and be under no apprehension that he will one day come to an untimely end, by toppling down a chimney or plumping into the jaws of a cat.

THE RUNT.

Despite all that has been written to the contrary, experience warrants me in strongly recommending runts to the amateur pigeon-keeper; indeed, one circumstance alone entitles them to be considered the "boy's first pigeons," and that is, that they are almost as unlikely to fly away as are your chickens. They are very heavy birds, and when well fed will find it difficult to mount, even as high as a house. They require no loft or dovecot, and, if properly tended, would thrive as well

in a rabbit-hutch as anywhere. They are capital birds to breed for the table, being very prolific. I have known as many as fifteen young ones produced in a year by a single pair; and I have dined off many a plump squeaker runt, whose flavour has been exquisite, and whose weight, when ready for the spit, has exceeded a pound and a quarter.

There are several varieties of runts,—the Roman, the Leghorn, the Spanish, and the Friesland, being among the number. The Roman is the largest, and easiest to manage of any. The Leghorn comes next, and is one of the most favoured by fanciers. It is shaped much like the tumbler, but in size and habit is very different. It is remarkably short from the base of the back of the neck to the root of the tail, and very full and broad bosomed. It has a round head and sunken eyes, surrounded by a tough skin. A small wattle surrounds the base of the beak, which is slightly hooked. The most favourite colours with the "fancy" are dark slate and red. If they be bred specially for the table, however, I should recommend that the lighter colours be chosen,—white, mottled, or pure white; for the general rule of colour affecting quality in the flesh holds good in tame pigeons. The black and dark feathered are proportionally dark or brown fleshed, of high flavour, inclining to the game bitter of the wild pigeon. The light colour of the feathers denotes light and delicate flesh.



RUNT PIGEONS.

The Spanish runt is the smallest, with a long body and very short tail and neck. The most curious runt of all is he of Friesland, his feathers being all set the contrary way; so that if you wish to smooth and caress him, you must begin at his tail and bring your hand forward towards his neck. This peculiarity greatly interferes with the bird's flight; and whereas every other pigeon, when at large, roosts with his face to the wind, so that his plumage may not be ruffled, the Friesland runt, for the same reason, turns his tail to the breeze.

The "frill-back" is another favourite, though rather scarce variety. He is invariably white or cream-coloured, and the peculiarity of plumage, from which its name is derived, con-

sists of all its feathers curling upwards, so that the point of each stands out, and the whole has the appearance of a plaited frill.

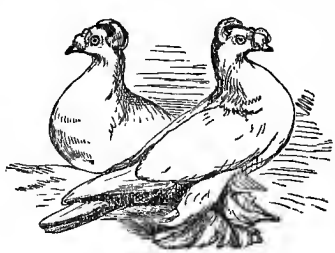
The runt is rather more subject than any other pigeon to the disease known as "wet roup;" when this is the case, give him a pepper-corn every day till he is better.

THE TRUMPETER.

This should be a favourite, either in the dovecot, or loft, as it possesses almost every quality desirable in a pigeon. It is hardy, a good breeder, a moderate flyer, has an uncommon and attractive appearance, fattens easily, and eats very tender.

He may be known by the moustache that decorates the upper half of his beak, by his "runty" shape, by his legs being thickly feathered to the very heels, and by a little bunch of curled feathers on the summit of his head. All birds of this species, however, have not this latter peculiarity, and when they have they are specially known as crested trumpeters. Yellowish white is the trumpeter's most ordinary colour, though they may not unfrequently be found beautifully speckled black and white. From a "fancier's" point of view, the trumpeter should possess a big round head—the bigger and rounder the better; a full and bushy moustache, too, is especially stipulated for, and paid for, too, handsomely. For my part, however, I should always be content to see my birds moderately moustached, and not over big-headed, and to pay eighteenpence or a couple of shillings each for them, instead of a guinea, as I otherwise should.

It is said that the bird derives its name from the fact of its emitting a sound like the blowing of a trumpet. However, like many other things that are "said," this seems to me an exaggeration. The bird in question coos rather more sonorously than most of his brethren, and that, as far as my experience goes, is all.



TRUMPETER PIGEONS.

Says Mr. Brent, "The trumpeter is regarded by naturalists as one of the purest varieties of our domestic pigeons, and they affirm,

that if once crossed, the breed cannot be bred back again; hence, these cross-bred birds are always deficient in some point—either the voice or one of the turns is wanting. As a case in point, my father, many years back, was very desirous of obtaining some trumpeter pigeons, and could then only procure one cock and his half-bred daughter, from which he bred, matching the cock again with his daughters of the second and third generations, without obtaining one young bird with the tuft over the beak. At the fourth generation he reared a handsome, black-mottled young cock with the desired tuft; but, to his great disappointment, he did not trumpet, although he was fifteen-sixteenths pure bred, and breeding so close stopped reproduction. Surely such experiments go far to prove the distinctness of what are sometimes called mere varieties."

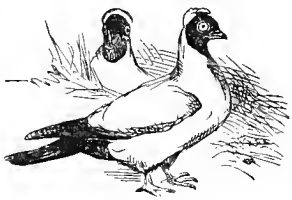
THE NUN.

This is an extremely pretty little bird. In shape it is something like the tumbler, and, like the latter bird, it has a tuft of feathers rising from the back of the head. "To be perfect," says a writer who has made this bird his peculiar study, "the head, flight-feathers, and tail, should be of some dark colour, either yellow, red, or black. The breast, belly, upper part of the wings, back, and neck, should be pure white, and there should be a frill of white feathers over the head. According to the colour of the head, it is called the red, black, or yellow-headed nun. If the bird have foul feathers, that is, if he have white or speckled feathers, where they should be one of these colours, whether it be on the wings, head, or tail, it is called foul-feathered, and the value of the bird is much less than it would have been if the feathers were pure in colour. He should have a small head and beak, and the larger the tuft or hood is the handsomer does the bird appear, and the more valuable it is reckoned by the fancy."

On the continent there are two sub-varieties of the nun, the one called the beard pigeon, both in France and Germany; but it differs only in having white flights, the head and tail being the only coloured part; the other having the tail also white, the head only coloured. By the French amateurs, this is called the death's-head pigeon.

"The most beautiful specimens of nuns," says Temminck, "are those which are black, but have the quill-feathers and the head white: they are called *Nonnains Maurins*." The most

useful sort, however—and exceedingly charming birds they are—are what Buffon styles *Coquille Hollandaise*, or Dutch shell-pigeons, "because they have, at the back of their head, reversed feathers, which form a sort of shell. They are also of short stature. They have the head black, the tail and the ends of the wings also black, and all the rest of the body white. This black-headed variety so strongly resembles the Tern (*hirondelle de mer*), that some persons have given it that name." Several other fanciful names have been bestowed upon it, but none appears so appropriate as that of Nun, especially in the black-headed variety. The best-marked birds will sometimes throw out a few foul feathers; from such birds, however, though not so much valued in themselves, can often be obtained as clean-feathered birds as those that are not.



THE MAGNIFICENT.

PIGEONS.—PART II.

DOMESTIC PIGEONS.

THE ARCHANGEL.

No bird is more rich and unique in its colouring than this. It is a steady breeder and a handsome flyer; but from some oversight the stock is so little cultivated, that first-rate archangels will fetch almost enough money to stock a dove-cot with tumblers, or other of the commoner sorts.

The head of the archangel (his name would bespeak him a Russian) is decorated with a little plume much like that of the crested trumpeter; his head—indeed the whole fore part of his body—is copper-coloured; the tail, wings, and hinder parts of the body, of a dark blue; the iris orange-red, and the feet crimson. Altogether the archangel is a bird whose acquaintance is desirable. A person accustomed to pigeons can tell almost to a certainty which are the cocks and which are the hens. The cock has a thicker neck, a stouter bill, and is fuller about the cheeks. The hen looks milder; has a more timid expression of face; is thinner about the neck, base of the beak, and cheeks.

The age of pigeons is more difficult to determine than their sex. Young birds that have not yet moulted may be

known by their duller plumage, owing to the nest feathers of dark birds being edged with brown. Their wing-pinion feathers are also smaller, more pointed, and frequently brownish at the tip. Even if they have moulted, these, the secondary wing-feathers, are usually retained till the next summer, and appear smaller, dingier, and of less substantial fabric to what they assume afterwards.

Old age shows itself in the wrinkling of the nostril covers, the sunken eye, the rough and thickened appearance of the eyelids, and the rough feet.

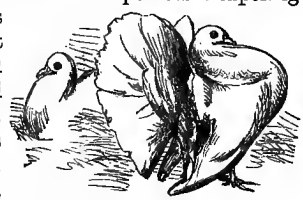
It will, however, be found more difficult to discriminate between the sexes among fancy pigeons than among the common dove-cot stock, where all the birds are of a certain stamp. It will be, therefore, as well—as regards fancy pigeons especially, considering the extra pecuniary loss a mistake in selection may involve—to lay down more explicit directions to tell a cock from a hen bird, whatever may be the breed. The following are the rules observed by one of the most successful of modern pigeon breeders, and laid down by him for the benefit of his kind:—

"The cock's breastbone is longer than the hen's; her vent bones are set wider apart; but this, also, varies with age. The coo of the cock is also louder, and more sonorous, than that of the hen, which is shorter, and somewhat hurried in manner; neither does the hen generally coo so much as the cock. Lastly, their gestures are the most certain signs. Place the doubtful bird in the matching-pen, away from all others, for a few days, till it gets tolerably used to its new abode, which will much depend upon the bird's being wild or tame. Secrete yourself where you may not be noticed, if the bird is wild, but where you can see its manners and movements; then introduce a merry cock, who will at once play up to the stranger, and, if a hen, she will acknowledge his advances by the twinkling of her eyes, nodding her head, an action of the throat as if swallowing, slightly fluttering her wings, and, as she moves before him, making a curtsey, at the same time raising the shoulders of the wings, and slightly spreading her tail. On the other hand, if a cock, a battle will most likely be the result, from which the later-introduced bird generally tries to escape. In this case, remove him, and put in a hen, to which, if he is at all inclined to mate, he will at once play up in a merry tone, bowing his head, sweeping the ground with his spread tail, and sometimes spinning round and round, or jumping after her."

THE FANTAIL.

Like the runt, this beautiful bird will be better suited in a house a few feet from the ground, than in one perched at a great height. In my opinion, it is the most elegant of all pigeons. It is most commonly pure white, has a long and delicately-curved neck, and altogether much resembles the swan, both in its formation and gait.

To approach perfection, the fantail should possess a tapering neck, and so long, that at times the bird's head will nestle amongst the tail-feathers; the breast should be very full and prominent, and the tail should be always erect. The tail should never number less than twenty-four, or more than thirty-six feathers; otherwise, from sheer weight, the tail will droop, and the beauty of the bird be considerably marred.



FANTAIL PIGEONS.

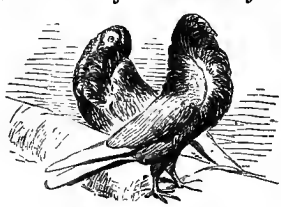
The fantail is likewise called, by writers, the "broad-tailed shaker. Willughby calls it so. "They are called shakers," says he, "because they do almost constantly shake or wag their heads up and down; broad-tailed, from the great number of feathers they have in their tails; they say not fewer than twenty-six. When they walk up and down, they do for the most part hold their tails erect like a hen or turkey-cock."

If you breed the fantail with another species of pigeons, the fantail will, either wholly or in part, disappear; if only in part, then it is called a "half fantail," or "narrow-tailed shaker." It is possible, however, to restore the true breed by matching an entire fantail with a "narrow-tailed shaker."

THE JACOBITE.

This bird is variously known as the "jack," the "ruff," and the "capuchin," as well as by its proper title. Its chief peculiarity is a frill of inverted feathers, the back of the head resembling, to a fanciful imagination, the cowl of a monk, whence its name. This frill is called the "hood," and the closer and more compact it grows the greater the bird is prized. The lower part of the hood-feathers is called the chain, and they should be of such length as to admit of their being lapped over in front of the bird.

"*Jacobines*," says Willughby, "are called by the Low Dutch *cappers*, because, on the hinder part of the head, or nape of the neck, certain feathers reflected upwards encompass the head behind, almost after the fashion of a monk's hood, when he puts it back to uncover his head. These are called Cyprus pigeons by Aldrovandus, and some of them are rough-footed. Aldrovandus hath set forth three or four either species or accidental varieties of this kind. Their bill is short; the irides of their eyes of a pearl-colour, and the head in all white." They are variously coloured: white and blue, and white and black, and mottled. Whatever colour they may be, however, to be considered handsome, they should have a white head, a white tail, and white flight-feathers. The head should be very small, and the beak short and spindled. The feet of some jacobites are feathered to the toes, while those of others are bare; this, however, is of little consequence.



JACOBIN PIGEONS.

A good authority says, "The ruff is a pigeon very much like the jacobite, and one which is often sold for it; but the true ruff is altogether a larger bird. It has a larger head and longer beak; the chain of feathers does not flow down so near to its shoulders, but it is longer, and not so thick. The capuchin may be considered as merely a variety of the same breed. The capuchin is larger than the jacobite, and has a longer beak; it has a ruff, or hood, but the feathers do not come down in the same manner, and form a chain, as in the other varieties."

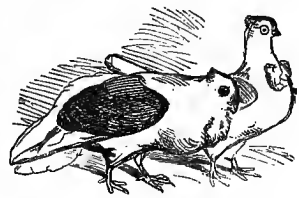
THE TURBIT.

The turbit in shape much resembles the jacobite; but it has not the head-covering that distinguishes the latter bird. It is not, however, without finery, and may boast of a finely-frilled shirt-front. This is occasioned by the breast-feather leaning contrary ways and standing straight out.

Turbits are classed according to the colour of their shoulders, much in the same way as nuns are from the colour of their heads. There is the blue and blue and yellow shouldered turbit. Besides these, there are birds of this species all of

one colour. A turbit's chief points of goodness are a short bill, a full frill, and a small round head.

"Wholly white turbits," says a recent authority, "have been also written of, but I have never seen any that might not be with as much propriety called owls; for the distinction between the owl and turbit consists in the head, beak, gullet, and frill, and though slight and scarcely observable to an uninitiated eye, yet there is sufficient difference to constitute them separate varieties independently of colour. The beak of the owl is more hooked, the upper mandible bending over the lower, which, combined with their shy and wild nature and their prominent-looking eyes, has given rise to their English name of owl pigeon. The eye, too, is of a pearl or gravel colour, very different from the turbit's, the head is rounder, and the frill rarely so long. The old writers describe it as opening and reflecting both ways like a rose, which could not be said of the turbit's frill.



TURBIT PIGEONS.

"The points of the owl may be enumerated as follows:—Beak short and hooked; head round; eye pearl-coloured and bolting; gullet well developed; frill rose-shaped; size small; general appearance wild; colour blue or silver, with black bars across the wings, and a light powdery cast of colour about the neck. I am not aware that this variety is known in France, though they have a white variety of turbit, *Pigeon Cravate Blanc.*"

THE BARB.

As its name implies, this bird is originally a native of Barbary. It is a pretty little creature, a fertile breeder, and a good nurse. Seen at a short distance, it is easily mistaken for the carrier. It has a short back and a small wattle. Its chief feature, however, is a spongy pinky skin round the eyes, which increases in size till the bird is three or four years old. In young birds, this wrinkled skin round the eyes is hardly perceived.

The best colour for barbs is an entire black. In such, the prismatic shadings of the neck are particularly beautiful, and the scarlet circle round the eye forms a very handsome contrast. Dun-coloured barbs are also met with occasionally.

Pied, mottled, or fowl-feathered, are of the commonest. The mahomet, or mawmet pigeon, as it is called, is probably nothing but a white or cream-coloured barb, with a cross of the turbit in many instances.

BARB PIGEONS.

Aldrovandus says that the eyes should be crocus-coloured, but English fanciers prefer them pearl, surrounded by a broad cere of naked, red skin—the broader, evener, and redder it is, the more are the birds esteemed; the neck long and thin; the chest full; the body long; the feet rather stout, and the pinion-feathers very long.

THE SPOT.

The spot, one of our oldest-established "toy" pigeons, is supposed to have been first introduced into this country from Holland. The name is derived from a coloured spot on the head.

In size, form, and manners, they resemble the common dove-house pigeons. They are pretty, very productive, and well adapted to find their living in the fields. They are sometimes turn-crowned, though generally smooth-headed, and clean-footed; the eye is dark, as is the upper mandible, and the lower is white; on the front of the head, above the beak, is an oval-coloured spot, from which they derive their name; and the tail is also coloured; the rest of the plumage is a clear white. Spot and tail are of the same colour, either black, blue, red, or yellow. They are designated black, blue, or red spots, accordingly.

THE HELMET.

This bird, at one time very common in this country, is now but seldom seen. The upper mandible is dark, the lower light; the top of the head, in a line from the corners of the mouth across the eyes, is coloured, giving the bird the appearance of wearing a cap or helmet; the tail is also coloured, the rest of the body being white, except in those that are feather-footed, in which the feathers on the feet, from the heels or hocks down the toes, are coloured like the head and tail; the irides are often black, though very frequently broken or half-coloured.

Moore, in his "Columbarium," in describing this variety of toy pigeon, says, "This pigeon is much about the size of a nun, or somewhat bigger. The head, tail, and flight-feathers of the wings, are always of one colour, as black, red, or yellow; and I have been informed there are some blue, and all the rest of the body white, so that the chief difference between them and the nun is, that they have no hood on the hinder part of the head, and are gravel-eyed." He further remarks, "They are called helmets, from their heads being covered with a plumage which is distinct in colour from the body, and appears somewhat like a helmet to cover the head."

THE MAGPIE.

This pigeon, a descendant of the once celebrated German magpie-tumbler, has been of late years so neglected as to have lost all pretension to gymnastic ability, and has altogether sunk to the insignificant level of a "toy." The head, neck, crop, the scapular feathers, and the tail, are coloured,—as black, blue, red, yellow, &c. The wings, the lower part of the breast and thighs, are white; and in the accuracy of their marking their value consists. The scapular feathers, being dark, overlay the upper part of the wings, which cause them to appear somewhat narrow. They are called, according to colour, Black Magpies or Red Magpies.

THE MAHOMET.

In a treatise on Pigeons published in 1795, this old fashioned member of the pigeon family is described as "nearly of a cream colour, with bars across the wings as black as ebony, the feathers very particular, being of two colours: the upper part or surface of them appearing of a cream, and underneath a kind of sooty colour, nearly approaching to black, as are, likewise, the flue feathers, and even the skin, which I never observed in any other pigeons but these; its size much like that of a turbit, with a fine gullet, and in lieu of a frill the feathers appear like a seam; the head is short, and inclined to be thick, hath an orange eye, and a small, naked circle of black flesh round the same, and a beak something resembling a bullfinch's, with a small black wattle on it."

Naturalists are, it would seem, not at all agreed as to the classification of this pigeon. There is in Germany a breed of pigeons between the Turkish and the Scandaroon, and, according to Bechstien, when these "are of a particular blackmottled,

they are called Mahomets." In France again, a cross between the Barb and Scandaroon is called after the infidel prophet, into whose ear—so the heathenish legend runs—a white pigeon whispered the heavenly orders it had just received. Sceptics accuse Mahomet of enticing the pigeon by filling his ears with *peas*.

THE LAUGHER.

"This pigeon," wrote Moore, nearly seventy years ago, "is about the size of a middling runt, and much of the same make, and I am informed has a very bright pearl eye, almost white. As for its feather, it is red mottled, and some tell me they have seen blues. They are said to come from the Holy Land, near Jerusalem. When the cock plays to his hen he has a hoarse coo, not unlike the gurgling of a bottle of water when poured out, and then makes a noise which very much imitates a soft laughter, and from thence this bird has its name."

For many years after the above was written, this peculiar breed was allowed to die out. Recently, however, a few have been introduced into this country from Mecca, where they are much esteemed. In form they closely resemble the dovehouse pigeon, with the addition of a tiny feathery peak surmounting the crown of its head. In colour they are a light "haggle," that is, something between a grey mottle and a grizzle.

"The great peculiarity of this variety of domestic pigeon," says a modern authority, "consists in their strange voice, which baffles description. It is prolonged, broken, and gurgling in utterance, not so sonorous as that of the trumpeter, but more varied, sometimes resembling what we might imagine an almond tumbler to say if he stammered, and, again, rather resembling the purring coo of the turtle dove. It is, too, often interrupted by one or more inspiratory 'ahs,' from which, perhaps, they obtain the name of Laughers."

THE OWL.

As before mentioned, this bird closely resembles the Turbit, and should have the same short round head and stunted beak.

OWL PIGEONS.

According to Mr. Brent, although blue and silver are the chief and best colours for the owl pigeon, yet other colours, as white, black, or even yellow, are sometimes met with, and I have seen some recently in Lon-

don white with black tails. It has been recommended that the breeding-places for these birds should be private and secluded, as from their wild nature they are liable to be disturbed.

HOW TO TRAIN PIGEONS TO "FLY."

Having selected the sort of pigeons you wish to train, your first aim must be to not only instil in them a fondness for their home, but to make them familiar with the appearance of its exterior, as well as of the surrounding neighbourhood generally. By-the-by, it should have been mentioned that it is almost useless to attempt to train adult pigeons to the flying business. Pigeons have curiously tenacious memories, and if it should happen, even a year after they come into your possession, that they, in the course of a journey, catch sight of their old abode, or even of a "flight" with which they were once familiar, it is a chance if you ever see them again. To return, however, to the subject of training. After keeping your pigeon well fed in the loft for about a fortnight, during which time you will have paired him with a sober and thoroughly settled hen bird of your establishment, you may allow him, under her charge, to go into the trap or area, and look about him. After a few days more you may let him fly at his will. When he seems to fly "strong," he may be carried out on a bright day to a distance of, say a mile, to essay his first "homing." It should be borne in mind that the earlier the bird is taught to rely on his own "homing" instincts, the greater proficient he is likely to become.

The box or basket in which pigeons are carried out to be let off or "tossed" should be constructed with a view to the bird's ease during the journey. If your box is large enough to contain more than one bird, it should be divided into compartments. "It may be from six to eight inches deep, and ten or twelve inches broad; the length will depend on the number of compartments. These may be five inches broad in front, and may either be made straight, or the partitions may be put in obliquely, leaving only one inch width at the tail end, the wide end of the open spaces coming alternately. Thus the pigeons are placed in it alternately head to tail, side by side, by which arrangement much space is economized. The lid is made in pieces, or so jointed that only one bird is let out at a time. A stout leather strap passes over all, and is secured by a buckle or padlock. The boxes should have an air-hole above the head of each pigeon, as well as in the front end of each compartment.

The bottom of the box or basket should be strewn with chaff, to keep their flights and tails clean and dry. Carrying in the hand cramps the birds, and causes diarrhœa; crowding in a bag or basket soils their tails and wings, while the pocket is equally objectionable."

In training the young pigeon to fly, care should be taken that he is neither too full nor too empty. In the first case the weight of his crop will make the bird heavy and lazy, and induce him, perhaps, to settle at the least excuse; and, in the second case, he may be compelled to halt in his flight through sheer faintness and exhaustion. The time most favoured by professional flyers to fly their birds is in the case of a hen when she has very young squabs at home, and with the cock when he is "driving to nest."

An able writer on this subject asserts that a high range of hills, or a fog or mist, intervening between a pigeon and its home, will so confuse the bird as to cause it to swerve from its true course, so much even as to cause it to be lost. This, however, is open to question, as London pigeons seldom or never have a chance of a clear day for a fly. Besides, if the birds were so dependent on their visual organs, how is it that night matches are so frequently and successfully flown?

Finally, "Great care is necessary to keep them in continual practice, as also in good flying condition—strong, healthy, and clean—by means of good food and plenty of exercise; otherwise they may one day be missing, although they may have performed the same distance often before."

THE SPORT OF PIGEON-FLYING—ANCIENT AND MODERN.

In nothing does man display so much ingenuity as in providing himself with amusement, or, what is infinitely worse, with an excuse for indulging in that pernicious passion, gambling. He has called on nearly every animal on earth to pay him toll in this respect. Horses run races for him; dogs fight bulls, or bears, or badgers, or cats, or rats, or, lacking other material, each other, for his delectation. From time immemorial donkeys have been pressed into the service, and even the harmless pig must not be excluded because of the fun that may be manufactured by greasing his tail, letting him loose, and then endeavouring to recapture him by that unhandy appendage. Cock-fighting dates from the period when that bird first became subject to man's dominion, and for want of larger game, the Asiatics pit quails against each other.

Pigeons are not excepted from the rule, and pigeon-flying has been a British sport from time immemorial. Up to the close of the last century it was an ordinary occurrence for men to stake hundreds of pounds on the result of a "prize flight." Carriers of the best breed were brought in hundreds from France and Germany, and then released in one great flock to find their way back across the sea.

As late as 1828, we read that, "fifty-six carriers brought to London from *Liege* were flown in the neighbourhood of Aldersgate-street, at thirty-four minutes past four A.M. One of them called Napoleon reached its destination—a distance of three hundred miles—at twenty-four minutes past ten the same morning, having thus accomplished its journey in five hours and fifty minutes, being at the rate of forty-five miles an hour."

About the same period "Mr. Atwood made a bet of one hundred pounds that he would fly six pigeons from the high ground near Crostwick, in Norfolk, one hundred and fourteen miles, and that one should arrive at his loft in the Sanctuary, St. George's Fields, within four hours and a half."

Folks of the present generation, however, are too wise to cast hundreds of pounds to the mercy of the winds—at least as regards pigeons. It is seldom now that they are made the subjects of wholesale wagering, though a briskish business is still carried on in low neighbourhoods, the stakes ranging from half-a-crown to five pounds.

Bethnal Green is the head-quarters of the London "Fancy." There is a long straggling street there known as Hare-street, and it is no exaggeration to say that the roofs of at least two-thirds of the houses are decorated with a dormer, and equally true that, protruding from almost every trap-door appertaining thereto, is the shock-head and the ragged shoulders of some dirty idle scamp whistling through his fingers, or "hishing" and shouting while he waves a long wand with a rag tied to the end.

The pigeons most favourite for match-flying among the vulgar "fancy" are known by the uneuphonious name of "skinnems," and are a cross-breed between the dragon and the tumbler. The "skinnem" is not a respectable-looking bird. With the litheness of the carrier, he possesses none of that graceful bird's gentle—not to say aristocratic—mien; he looks like the disreputable member of a highly respectable family, addicted to pot-houses and evil company, and altogether gone to the bad.

Nor is the "skinnem's" a solitary instance of how the brute creation may be influenced, their very natures and complexions perverted, by low human associations. Take the St. Giles's dog. Is he for a moment to be compared with the dog of St. James's? Isn't he a rakish-looking brute, with an insolent curl of the upper lip and an unpleasant scowl? Isn't he a gutter prowler and a worrier of sheep? Then, again, the costermonger's donkey; is he anything like the sleek and decent suburban animal who draws invalid chaises? It may be argued that stripes and bruises are not calculated to improve the personal appearance; but I maintain that stripes and bruises alone would never give to the costermonger's donkey the air of dissipation, the short pipe and beery expression so peculiar to him. Look at the fowl—the cocks and hens of our rookeries! Isn't the cock always an untidy little wretch, with a ragged comb and spurs broken to splinters? How is it possible to believe that a bird of this sort rises and crows at daybreak? Then the hens, the slovenly creatures, with their tail feathers all mud-bedraggled; it may be, certainly, that they are driven to recklessness by their husbands' misbehaviour, but there is no denying that they one and all look capable of larcenously disposing of their own eggs and buying barley with the proceeds. So it is with all sorts of song-birds that are trained to sing against each other (especially the chaffinch) for the benefit of their blackguardly masters. And lastly, but by no means least, so it is with the low-neighbourhood sparrows. To my certain knowledge—but, there, everybody knows the saucy scamp the London sparrow is!

To return, however, to the subject of pigeon-flying and pigeon-flyers. I had lost some pigeons of a valuable sort from my dormer, and while I was still disconsolate for the same, the postman brought me the following missive:—

"SIR,—Seein' the reward as you have offered for some pigins as flowed away from your dormer, I rite to tell you as you might get a 'int about 'em if you cum and brought the reward with you to the Bald Pye Public 'ouse, Bethnal Green, on Sunday night at 8.

"Pea Es. Arks for Mr. Stickle."

As requested, I repaired to the "Bald Pye," and there, through Mr. Stickle's instrumentality, obtained my strayed pets. I suppose I paid rather more for their recovery than was expected, for Mr. Stickle became suddenly extremely good-natured, offered to show me his stock, and, finally, in-

formed me that if I took any interest in flying matches, a "first-rate" one was coming off in the morning, and that if I liked to come up to his house I was welcome to a seat on the roof thereof to witness the start and the return.

The start was a tame affair, and consisted merely of the owners of the pigeons setting out from the "Bald Pye" with their birds, attended by a troop of tattered bird-gamesters. From Highgate-hill home were the terms of the match—"home" being a dormer adjoining Mr. Stickle's. One of the contending birds belonged to a gentleman named Tinker, the other to "Phil." Phil *what*, didn't transpire.

As the time approached at which the birds were expected to return, Mr. Stickle and I mounted his dormer. Presently a triumphant shout from the man on the opposite roof announced the coming of at least one of the birds.

"Here he comes!" roared Mr. Tinker; "I knows him; here he comes, and the other ain't no-wheres!"

Yes, there he came, fair and promising enough, till he got within a few yards of his home, and then in the coolest and most aggravating way, he settled on a neighbouring chimney stack.

"The appearance of Mr. Tinker's face at this moment was terrible. He fairly champed his teeth together, and wagged his head at the refractory 'skinnem' till his hair was like a trundled mop. He clenched his great fists, and sparred at the little pigeon, as though it were a man. Finally, as the shouting of Phil's friends smote his ears, 'Here comes Phil's! Phew-phew-whew-whew! here she comes!' he caught up a brick that was lying handy, and flung it at the 'skinnem' with all his might.

"The cruel act was more successful in its results than he deserved it should have been. The 'skinnem' rose to avoid the missile, wheeled round, and then settled within a foot of Mr. Tinker's head.

"Grabbing at it eagerly, that gentleman disappeared down the trap; and the next moment, peeping over the coping of the house, we saw him skimming down the street, the pigeon in his cap, and the cap in his mouth, and his long coat tail spread abroad like wings. At the same moment, Philip, with his cap in his hand, dodged out of a side street. Tinker, however, had the advantage, and spurred to his utmost speed by the sight of his approaching rival, he dashed over the threshold of the Bald Pye, winning the match by rather more than two seconds."

PIGEON CATCHING IN THE PYRENEES.

Once, while the late Angus B. Reach was travelling in the south of France, he had an opportunity of witnessing, if not the actual performance of pigeon-catching by the professional catchers, a clear insight into the way in which the business was managed. He thus describes it:—

"Stretching manfully uphill, by a path like the bed of a muddy torrent, I was rewarded by a watery blink of sunshine. Then the wind began to blow, and vast rolling masses of mist to move before it. At length, however, I reached the Palombière, situated upon the ridge of the hill, which cost a good hour and a half's climb. Here grow a long row of fine old trees, and on the northern side rise two or three very high, mast-like poles of liberty, notched so as to allow a boy, as supple and as sure-footed as a monkey, to climb to the top, and ensconce himself in a sort of cage, like the 'crow's nest' which whalers carry at their mast heads for the look-out.

"I found the fowlers gathered in a hovel at the foot of a tree; they said the wind was too high for the pigeons to be abroad; but for a couple of francs they offered to make believe that a flock was coming, and show me the process of catching. The bargain made, away went one of the urchins up the bending pole into the crow's nest, a feat which I have a great notion the smartest topman in all her Majesty's navy would have shirked, considering that there were neither foot-ropes nor man-ropes to hold on by. Then, on certain cords being pulled, a whole screen of net rose from tree to tree, so that all passage through the row was blocked.

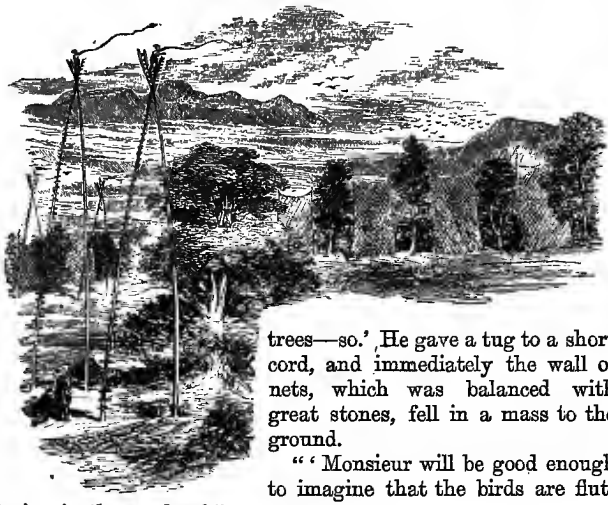
"'Now,' said the chief pigeon catcher, 'the birds at this season come flying from the north to go to Spain, and they keep near the tops of the hills. Well, suppose a flock coming now; they see the trees, and will fly over them—if it wasn't for the pigeoneer' *(pigeonier)*.

"'The pigeoneer! what is that?'

"'We're going to show you,' and he shouted to the boy in the crow's nest, 'Now, Jacques!'

"Up immediately sprang the urchin, shouting like a possessed person, waving his arms, and at length launching into the air a missile which made an odd series of eccentric flights, like a bird in a fit.

"'That is the pigeoneer,' said the fowler; 'it breaks the flight of the birds, and they sweep down and dash between the



trees—so.' He gave a tug to a short cord, and immediately the wall of nets, which was balanced with great stones, fell in a mass to the ground.

"'Monsieur will be good enough to imagine that the birds are fluttering in the meshes.'"

THE PIGEON-HOUSE.

If the number of pigeons you intend keeping be but few, say ten or a dozen, a very good habitation may be constructed by securely fixing a light flour barrel on the end of a stout pole You can hardly have the pole too high, but very good shift may be made with one measuring twenty-five feet, which will allow of six or seven feet of the stout end being sunk in the ground. Stout rails of beech should be nailed at intervals of nine inches to the summit of the pole, projecting six inches on either side so as to form a ladder. Securely fixed to the top of the pole, and pendant on either side of it to the ground, should be a substantial rope to make ascent and descent more easy. A much more secure and easy way, however, and one less likely to lead to awkward tumbling, is to have a capacious tube, say a sufficient length of ironing-stove pipe run through the length of the barrel, so that it will slide easily up and down the supporting pole. Across the top of the pole should be screwed a cross piece, to each end of which must be attached a pulley. A rope passes over each pulley and is attached to each side of the barrel by a staple. By this means the barrel may be easily hauled up or lowered at pleasure.

Every pigeon, male and female, must have a separate apartment. Without this precaution your pigeon tower will be a very tower of Babel, rife with anarchy and confusion. Eggs will be smashed and infant "squeakers" (as baby pigeons are called) trodden under foot. So that if your pigeon-house is designed for twelve lodgers, it must be divided into twelve compartments. It is as well to fix a small tin hood above the doorway of each chamber as a security against inclement weather. The barrel should stand on a platform eighteen inches wide, and the whole should be painted white. This is especially important, because you thus provide your young and inexperienced birds with a conspicuous mark to direct their homeward flight. Even your old birds may be glad of such a beacon should they happen to be out in one of those sudden glooms which sometimes precede violent storms. The white of zinc paint is the most durable and brilliant. Once a month at least the separate chambers should be lime-washed.

If it is your intention to keep a large number of pigeons (and it is a well-known fact, that he who has a large number is much more likely to keep them than he who possesses but a few) the space afforded by a barrel will be of little use. You will require a loft, or a house specially built for the purpose. The attic of a lofty house makes a capital pigeon-loft, especially if the window be in the roof, or if in the side wall opening towards the south. Even in this case you must not forget the necessity of a beacon,—the nearest gable or chimney-stack should be frequently whitewashed. Bear in mind, likewise, that much light is not vitally important to pigeons, it being their nature to prefer gloomy and solitary places.

Outside the window, and hinged to the window ledge, you should have a moveable flap capable of covering the aperture (made by opening the window, or taking it out altogether) when it is pulled up, and of forming a platform parallel with the window ledge when it is let down. This flap should be painted white. The trap-string attached to the outer edge of the trap, should pass through the top of the window frame into the room. Inside the chamber, and covering half the window,—that is, covering the space created by raising the lower half of the sash,—a square box should be fixed. At the back of the box are two or three holes to admit the pigeons into the chamber, and each hole is so covered on the outer side by a hinged lath as to easily yield to the bird's endeavours to join his mates in the chamber, but to entirely prevent him

passing out of the window again without his master's assistance.

For your guidance as to the proper arrangement of the pigeon-loft for breeding purposes, I will give you the opinion of a sound and experienced writer on the subject.

"You may erect shelves of about twenty inches broad for breeding-places, allowing eighteen inches between shelf and shelf, that pouters may not be under the necessity of stooping for want of height; for in that case they would contract a habit of playing low, which spoils their carriage. In these shelves partitions should be fixed at about three feet distance, making a blind by a board nailed against the front on each side of every partition, which will make two nests in the extent of every three feet; and the pigeons will not be liable to be disturbed, as they will then sit in private. Some fix a low partition between each nest, which prevents the young ones from running to the hen sitting at the other end, and thereby cooling her eggs; for in breeding-time, when the young ones are about a fortnight or three weeks old, the hen, if a good breeder, will lay again, and leave the care of the young ones to the cock. Others let them breed in partitions entirely open in front, for the greater convenience of cleaning out their nests. I find by experience that nests made on the floor are much more convenient than otherwise, if the loft will admit of it, for it prevents the young ones from falling out of their nests,—which sometimes breaks a leg, and very often lames them,—and gives them a chance of being fed by other pigeons as well as their parents, which frequently happens.

"In every nest there should be placed a straw basket or earthen pan that has not been glazed, which prevents the straw from slipping about. The size of the pan must be in proportion to the pigeons you breed. For instance, a pan fit for a tumbler or other small pigeon should be about three inches high and eight inches over the top, and sloping to the bottom like a washhand-basin, and that in proportion for other larger pigeons, remembering to put a brick close to the pan, that they may with greater safety get upon their eggs; and by means of this pan the eggs are not only prevented from rolling out of the nest, but your young pigeons from being handled when you choose to look at them, which often puts them into a scouring."

Extreme cleanliness is absolutely necessary to the health—nay to the very existence of the pigeons. They possess remarkable warmth of body, so that, if you allow dirt of any kind to

accumulate on or near them, sickness will be the inevitable result. Sweep out their house every morning, and at least twice a week garnish the floor with some bright sifted gravel. Don't forget that first essential in all households—clean water! Let them have a broad shallow pan full of it, and let the pan be replenished every morning. In the hottest summer months twice a day will not be a bit too frequent. This will entail some little trouble, of course, but the pigeon keeper will find himself amply compensated if he will take the pains to watch through a chink, and see the grateful little creatures washing and pluming and plunging about in their refreshing bath. Besides this, they will require a constant supply to drink, and to guard against its becoming fouled by their excrement (as would speedily be the case if the water was contained in an uncovered vessel) a little ingenuity is necessary. No end of elaborate and expensive vessels have been invented, but the following will be found more thoroughly effective than any one of them, and certainly least expensive. Procure a big bottle with a longish neck, and an ordinary garden-pot saucer of a small size; fill the bottle to the brim, cork it up, and then suspend it in a convenient corner, *mouth downwards*, and with the nozzle of the bottle in the saucer, and within an inch of the bottom of it, half fill the saucer with water, and take the cork out of the bottle; you will find, that, replenished from the bottle, the saucer will be always full, but will never run over.

Mr. B. P. Brent gives the following instructions for the construction of an excellent pigeon-house for common pigeons and toys:—"The end of the roof of a barn, stable, granary, or dwelling-house, is equally available for the purpose. The entrance for the pigeons should be towards the south, south-west, or south-east; and, whether situated on the roof, or at the end of the building, must be well secured against the inroads of cats or rats. It should have some device by which the pigeons can be shut in when necessary; for instance, when the entrance is through a number of pigeon-holes, then a wired, or latticed frame, should let down in front, on hinges, by a string and pulley. If it is through a window, or opening in the wall or roof, a small platform, or alighting board, should be placed outside, and a lattice-door may be made to pull up, and close the space, so as to secure all the pigeons in the loft and yet admit light. The floor of the loft must be well secured, to prevent rats or mice getting in; and a door, well fitted, for the same reason, is necessary, to enter the loft to inspect the birds or

take the young ones. Nest places may be arranged all round, against the upright walls, by nailing up boards eight or nine inches wide, like shelves, fifteen inches above each other, and dividing these by partitions at every three feet, and nailing a board up in front at each end of these divisions, so as to form a recess at each end for the nests. A small slip of wood, running from back to front, completes the nests, which are thus divided into pairs; or, failing the upright walls, boards may be nailed along the rafters, like shelves, one over the other. Small pieces of board should be nailed in behind, between the rafters, and a long slip in front of the board; thus converting the shelf into a sort of trough, which can be divided into nests by simply nailing an upright piece of board against each rafter."

A bag-net, on a short pole, something like a landing-net, is also very useful for catching the pigeons, if their loft is large.

HOW TO STOCK THE PIGEON-HOUSE.

In the first place, avoid purchasing old birds. They may be more immediately valuable on the score of breeding, but as a set off to this advantage it is almost ten to one that their first flight from your dormer will be their last. True, by plucking out their larger quill feathers they may be induced to "haunt," or accommodate themselves to their new abode, on much the same principle as that you may induce the most wrong-headed dog to stay with you if you chop one of his legs off! Such barbarity, however, is not to my taste, and, I am quite sure, not to the tastes of my readers. Besides, I much doubt if this wing-maiming process is at all conducive to security. Beyond a doubt, the pigeon is possessed of at least average sagacity, and it is only natural to conclude that its horror of the perpetrator of the outrage will survive even after its ill effects have ceased, and that the first work of the pigeon's healed wings will be to carry him far away from the torture-house.

Apart from the humane view of the subject, wing clipping is otherwise objectionable. You reduce him at once from a handsome bird to a scare-crow. Nor is this all. You will discover when the moulting period arrives, that the ugly stumps will cling with unnatural tenacity to the skin, and if not immediately observed and rectified, inflammation, mortification, and death will rapidly follow each other.

It is advisable, therefore, to purchase "squeakers," that is, pigeons that are from a month to five or six weeks old, 'before which latter time they will have attained but little strength of wing. They begin to peck for themselves when they are five or six weeks old, and the sooner after that they come into your keeping the greater will be your chance of keeping them. Until, however, you are sure the pairs have really mated—until, indeed, they have laid their first eggs, it would be unsafe to trust them abroad. They would almost surely be inveigled away by the knowing old pigeons of the neighbourhood.

To distinguish the sexes during squeakerhood is rather a difficult matter to a new hand. In half a dozen birds, of the same age, the cocks may be known by their superior size, and the female squeaker has a more prolonged squeak than her male companion.

The sorts to be selected entirely depends on the taste of the keeper. If amusement be his only aim, then he should purchase tumblers. If he be determined to have none but highly respectable and graceful birds about his premises, he should buy archangels, or nuns, or owls. If profit be the sole consideration, then, I unhesitatingly, recommend runts. They are neither handsome nor good flyers, but they are wonderfully prolific, and substantial fellows for the spit or pie. They, however, are careless of their eggs, so that it is as well to turn their embryo progeny over to a careful nurse—the dragoon for instance.

But there can be no doubt that to start with the cheapest and commonest sorts is the best plan. If they abscond, the loss will be but trifling, and if they stay with you a month or so, not only will you have a better chance of retaining any of the more valuable sorts you may afterwards introduce, but the old lodgers will be useful as egg hatchers to their aristocratic neighbours should such service be required. The best time to begin to found a colony is about July, as pigeons are then cheapest.

PAIRING AND BREEDING.

When your squeakers have reached six months, you may "put them up for breeding;" that is, you must enclose the pair—the cock and hen—in a cage, out of sight of any other pigeon. At the expiration of two days you may give them their liberty again.

For a few days after this, the newly-married couple will give their minds solely to enjoyment, keeping always together,

and disporting themselves according to their natures. Presently, however, they will grow more sedate, and the hen will set about egg-laying. First she lays one, which she keeps faithful guard over, and next day she lays the other—always two, never more nor less.

At this period no husband is more faithful than the he-pigeon. He feeds his hen while she is sitting; he fills his crop with water, and from it she quenches her thirst. Towards the middle of the day she goes abroad for necessary air and exercise, while he contentedly cuddles the promising eggs beneath him. If, indeed, she should prove so callous a mother as to think more of taking her pleasure than hatching her eggs, father pigeon will meekly keep his seat, and comfort the eggs till the shells burst and the chicks emerge.

This will occur at the expiration of seventeen days from the laying of the second egg. On this point, as well as on another equally important, writers of pigeon books seem agreed to countenance a delusion. One author, whose information in all other particulars is tolerably correct, confidently asserts that the hatching will take place on the twentieth day from the laying of the second egg. Several others, with equal gravity, tell us that exactly nineteen days must transpire between the second laying and the birth, whereas the truth is—and everybody that has kept as few as half-a-dozen pigeons must be aware of it—that *seventeen* days, within a few hours, is the invariable time consumed by incubation.

Again, trusting entirely to information and instruction derived from writers whom, we presume, to be perfect masters of the subject, the amateur is subject to great disappointment as regards the number of hatchings he may reasonably expect in the course of a year. He is told that by proper management "he may raise as many as *twelve* broods in a single year." With all due deference to those who make the assertion, I declare that they are utterly mistaken. With proper management, if you are *very* lucky, you may count on a hatching once in every six weeks through the year, which will give you *nine* hatchings in the twelve months. Even this, however, is the exception and not the rule, and I should advise my readers to rest contented if they are enabled to raise *seven* broods in the time.

The writers in question would have been nearer truth if they had declared that a hatching or two more than usual might be obtained by *improper* management, that is, by stuffing the poor birds during the chilly months with hemp-seed. They certainly

may breed the faster for this treatment, and if the pigeon-keeper does not object to see his birds afflicted with unsightly skin disease, and liable to sudden death, I will guarantee them at least two more broods a year than their neighbours. One chick will be hatched six or eight hours before the other. I know of nothing so perfectly helpless as a baby pigeon. They have just sufficient instinct to hold up their little naked heads and wave it about feebly in search of the mother's bill, and that is all.

During the last few days of sitting, the crops of both male and female pigeon gradually fill with "soft meat," or, as it might with propriety be termed, milk—pigeon's milk! Although not a marketable commodity, we have the authority of Doctor Hunter that there really is such a liquid as pigeon's milk. The learned doctor says, "I have, in my inquiries concerning the various modes in which young animals are nourished, discovered that all the dove-kind are endowed with a similar power. The young pigeon, like the young quadruped, till it is capable of digesting the common food of its kind, is fed with a substance, secreted for that purpose, by the parent animal; not as in the mammalia, by the female alone, but also by the male, which, perhaps, furnishes the nourishment in a degree more abundant. It is a common property of birds, that both male and female are equally employed in hatching and feeding their young in the second stage; but this mode of nourishment, by means of a substance secreted in their own bodies, is peculiar to certain kinds, and is carried on in the crop. Whatever may be the consistence of this substance when just secreted, it must probably soon be coagulated into a granulated white curd, for in such a form I have always found it in the crop; and if an old pigeon is killed, just as the young ones are hatched, the crop will be found as above described, and in its cavity pieces of white curd mixed with some of the common food of the pigeon. If we allow either of the parents to feed the young, its crop, when examined, will be discovered to contain the same curdled substance, which passes thence into the stomach, where it is to be digested.

"The young pigeon is fed for some time with this substance alone, and about the third day, some of the common food is found mingled with it; and as the pigeon grows older, the proportion of common food is increased; so that by the time it is seven, eight, or nine days old, the secretion of the curd

ceases in the old ones. It is a curious fact, that the parent pigeon has at first the power to throw up this curd without any mixture of common food, although afterwards both are thrown up according to the proportion required for the young ones. I have called this substance curd, not as being literally so, but as resembling that more than anything I know. It may, however, have a greater resemblance to curd than we are, perhaps, aware of; for neither this secretion, nor the curd from which the whey has been pressed, seems to contain any sugar, and does not run into acetous fermentation. The property of coagulating is confined to the substance itself, as it produces no such effect when mixed with milk." It is to be hoped, after this explanation, that big stupids will, in future, cease to send little stupids on that venerable first-of-April errand, "a pen'orth of pigeon's milk."

Inserting their own beaks into those of their infants, the parent pigeons proceed to pacify the hungry little maws with this nourishment;—pure, for the first five or six days, and then gradually amalgamated with hard food, until their stomachs grow strong enough to digest whole grains.

If the chicks, from some unhappy accident, should be left orphans, you may—if you are not over-delicate—rear them by hand, or rather by mouth! This may be done by manufacturing a pap of beans or corn by grinding it up with your teeth, and then taking the squab's beak between your lips and letting him feed. I don't know what my readers will think of this, but my deliberate opinion is that it is extremely nasty, and I would see the most valuable squab, that ever was born, dead, and buried in a pasty, before I would wet-nurse him in the way above described.

If the squab should die, it will be necessary to provide the old birds with, at least, one belonging to a neighbour, otherwise, the nourishment in their crops will turn sour and make them ill. If, however, a strange squab is not at hand, the next best thing is to keep the bereaved parents on the wing as much as possible, supply them, when at home, with a mixture of bread crumbs and salt, and strew their house with good sharp gravel.

Sometimes the new-born bird will not have sufficient strength to break entirely from the shell: you may, in such a case, gently assist him with some convenient instrument—say the blade of an ivory paper-knife. Should both parents chance to desert their eggs, you may throw them away at the expi-

ration of thirty hours, as by that time they will certainly have become spoiled.

If from any accident or caprice, the hen should one day fly off and not return to her mate, you had best not let more than two days elapse before you supply the bereaved husband with a fresh spouse; otherwise he will set off in search of his lost partner, and, probably, never return. If it is the cock-bird who mysteriously vanishes, you need not be so much alarmed; the mourning of the widowed pigeon will be but of short duration; she will lay wait for the first flock that comes along, make love to some good-looking single male, and at once invite him home. Instances are on record, of wild male-pigeons being enticed into bondage after this fashion.

FEEDING.

The staple of their food should be gray peas. They will, however, thrive well on wheat, or oats, or barley, separately or mixed. The smallest of beans, known as pigeon's beans, may also be given, but I should prefer to mix it with some milder grain. Care should be taken that the pigeon-beans are not newer than a year old, or they will scour the birds. Seeds are sometimes given as stimulants, and many use hemp-seed for the purpose. Rape-seed is, however, far preferable. Hemp-seed is of an exceedingly heating nature, and apt to induce skin disease. Equal care should be taken that whatever food you give them is not decayed, and full of mites. If you have the least doubt on the subject, bake the suspected grain for half an hour. Mites swallowed alive and *remaining* alive in the stomach have destroyed many a bird.

On this subject of pigeon diet, a reliable authority states, "Green food may be provided for pigeons, that do not have their liberty, in the form of lettuce; or salad may be sown in troughs, or boxes, for them to peck off; any smooth-leaved greens will be relished, but it requires to be fast or fixed, to enable them to pick little pieces out. Cress, rape-seed, or any of the cabbage tribe, may thus be sown for the pigeons. The dovehouse pigeons are usually fed in the poultry-yard; and the fancy pigeons, that are not to fly out, are fed from the hopper in their aviary, to which they always have free access. The same plan is usually adopted in lofts; but where other kinds are kept in pigeon-houses, or lockers, it is usual to call them by a whistle, or some other known signal, to be fed at some quiet spot near at hand; and on account of the fondness

of the birds for a young salad, not so much as food, but simply as a relish, I would advise the amateur not to entice them into the kitchen garden, or they may cause annoyance among the young crops.

"There is hardly any kind of grain or corn which pigeons will refuse, but their preference seems to be given to hemp-seed over every other; yet too much of it is injurious to them; and it has been found, in Germany, that, after the linseed harvest, pigeons are frequently ill, and die of diarrhœa.

"Although pigeons are granivorous birds, yet they will eat, and apparently enjoy, an occasional change of boiled potatoes, soaked bread, and bacon or ham fat, cut in small pieces; and there is a particular grub, or larva, which they find in old pastures, and eat when other food is scarce."

Pigeons are wonderfully fond of powerful odours, and, provided it is powerful, they are by no means particular as to its quality. Sprinkle their floor with lavender or assafœtida, and they will appreciate one equally with the other. It is reckoned a good plan to scent a pigeon-house previous to stocking it.

I am aware it will be accounted rank heresy amongst the "fancy," but I really cannot help speaking my mind concerning that abomination, the "salt cat." Ask nine-tenths of the most experienced pigeon-keepers, and they will tell you that without the "cat" luck will not abide in the dormer. Does the reader know how a "cat" is manufactured? I will tell him. You take half a peck each of brick-rubbish, gravel, and stiff clay, and add a quarter of a pound of anise-seed, and as much saltpetre. You put this mixture into a tub, and add sufficient stale chamber-ley to work it into mortar. This odoriferous compound you put into old pots and kettles, and stick about your loft! Ignorant and nasty fanciers will tell you that a better "cat" still is, a goat's head, stuffed with salt and hemp-seed and anise, and boiled in urine!

The simple fact is, it is necessary to the pigeon's health that he should be well supplied with lime and salt, and it is on these ingredients alone that the entire "cat" rests its claim for admittance into the pigeon loft. For all practical purposes, it will be sufficient to have in one corner a box containing old mortar, and in another corner a pan filled with nine parts common salt and one part saltpetre. It does not always do to follow "good old customs." In the time of our grandfather's father, the salt cat was a *real cat*, baked with salt and various spices!

To fatten young pigeons, the reader cannot do better than follow the following advice, given by a clever naturalist.

"When the squabs are about eighteen or nineteen days old, and their wing-feathers begin to sprout, take them out of the dove-house and place them in a nest in another room, covering them with an inverted hamper, which will keep out the light, and yet leave a free passage for the air. It is well known that all animals which are to be fattened artificially ought to be kept in the dark. Have ready a quantity of maize, which has been steeped in water four-and-twenty hours; twice a day, namely, early in the morning, and in the evening before nightfall, take each squeaker out of the nest, open its bill dexterously, and at each meal cause it to swallow, according to its breed and size, from fifty to eighty and even a hundred grains of steeped maize. Continue this treatment for ten days or a fortnight, and you will have pigeons as fat as the very best poultry. The only difference will be in their colour."

PIGEON PARASITES.

Unless the most scrupulous cleanliness be observed there will be bred among your birds' plumage a host of unpleasant insects, of the tick, mite, and flea orders. The most troublesome and common of these pests is the mite. It is the smallest of the pigeons' parasites, being no larger than grains of poppy-seed, of a black colour, with white streaks over their bodies. It does not seem to be their habit to infest the bodies of the pigeons constantly, but to hide in the chinks and dark nooks of the nesting-places, and when the unlucky birds retire for the night, then to issue out in myriads and commence their depredations, and continue them until they assume a totally different complexion to that worn at starting—being, in fact, red, instead of black and white. Squabs suffer much more than old birds from these predatory little creatures. They get into the ears of squabs, making them lean and miserable, and not unfrequently causing their death. Lime wash they defy; mercurial ointment they seem rather to relish. There seems to be no means of killing them, or of stopping their increase, when once they effect a substantial footing. One of the pigeon-wise men I know is compelled to confess that he scarcely knows how to treat them. "I am not sure," he says, "that I can offer a perfect cure for their attacks; but a drop of oil on the ears, under the wings, or anywhere else they may appear, will prevent their annoying the young ones. Powdered sulphur strewn

in the nests, and dusted among the feathers of the old birds, is the best plan I know of. As a preventive means I would advise cleanliness; stop all cracks and chinks; let the woodwork be planed and painted, and do not give the pigeons hay for nests. Heath and birch-twigs are the best. Washing the walls, painting the woodwork so as to stop all cracks, however minute, and perhaps the addition of powdered sulphur in the lime-wash, may be a good precaution."

Ticks, to my thinking, are even more objectionable than mites, although they are not nearly so plentiful. They grow sometimes as large as tares, so that the bird's depth of feather is insufficient to hide them. They are very quick in their movements. They generally infest the head and back of the pigeon. Cleanliness and powdered sulphur are the only effective weapons against them.

Feather-lice frequently swarm beneath the vanes of the pigeon's feathers. They, however, do not seem to cause the bird much inconvenience. Indeed, the theory has been ventured, that, so far from being inimical to the bird's well-doing, they are positive conducers to its comfort. "Their food being the down at the quill end of the feathers," say the advocates of this doctrine, "it seems almost as if they were intended to reduce the warmth of the bird's covering in summer; for their numbers must be very much decreased at moulting-time by the quantity cast off with the old feathers, and not until spring can they increase sufficiently to thin the warm under-covering of down which in summer is not so necessary for the pigeons as in the cold months of winter." It is pretty well ascertained, however, that their numbers may at least be thinned by a strict observance of cleanliness; and as cleanliness was never yet proved to be erroneous, the theory is in a slight degree shaken by that fact.

DISEASES OF PIGEONS.

If properly fed and cleansed and cared for, few birds are less liable to disease than the pigeon.

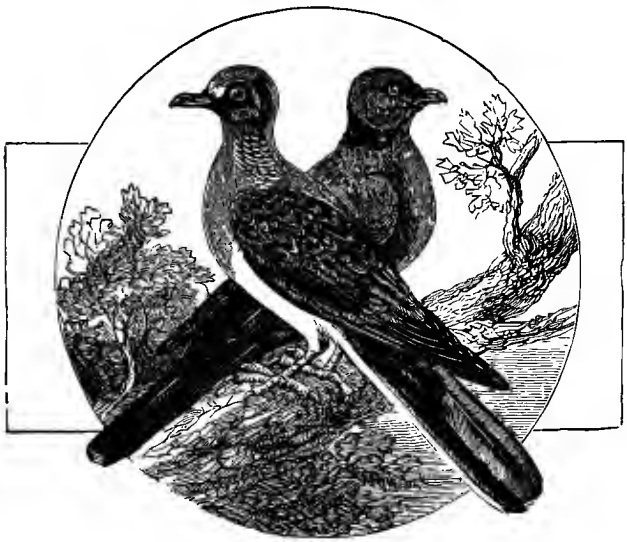
Their chief ailment is "canker," a very ugly disease, attacking the head, and causing cheesy-looking and evil-smelling swellings. The disease is attributed to various causes, to impure water, to drinking from a tin vessel, to a bad state of blood, and sometimes to the attacks of mites. An excess of food of a fatty nature will be likely to produce canker. The cure is spare diet, plenty of exercise after the excrescence has

been cut away and the place rubbed with caustic. It is generally thought to be contagious, so it will be as well to separate a bird so afflicted from the rest as soon as possible.

Some pigeons are afflicted with internal weakness, bringing on a disease known to pigeon-breeders as "gizzard-falling." This is nearly incurable, so the sooner you get rid of the poor bird the better.

If your pigeon should be affected with atrophy, or wasting of flesh, he should be supplied liberally with his most favourite food. A rusty iron nail placed in his drinking-vessel will strengthen his stomach. Birds afflicted with this complaint have usually a large appetite for green food, and no less an authority than Bechstien asserts that watercress is a certain cure for atrophy.

It will sometimes happen that a pigeon will have a difficulty in moulting his wing-feathers. When this is the case, take the bird in your hand, and see if there are any feather-stumps still clinging in the sockets. If so, extract them tenderly with a small pair of tweezers.



THE DOVES.

THE TURTLE DOVE.

The old proverb concerning the dog, that if you give that animal an ill name you may as well hang him, for all the chance he has of retrieving his character, is no more true than that dogs and birds and even men frequently acquire fair reputation, how no one particularly knows, or cares to inquire, but, like sheep following the bell-wether, steadfastly uphold it, and all because it is a much easier matter to lend your shoulder to a thing already securely upheld, and safe from falling, than to doubt its stability, and to pull and shake at it with no better reward than presently to bring down on you a burden you can scarce stand under.

The Turtle Dove is an example of this, and though it is, undoubtedly, a very nice little bird, and one quite worthy to be made a home-pet, there can be little doubt but that its surpassing virtues are better known to poets than to pigeon-breeders. Indeed, I am bound to say, being at the same time very sorry to have to say, that, from inquiry and personal observation, I am convinced that the turtle dove is no more

deserving the respect of mankind than the veriest runt or "skinnem" that ever fluttered on a dormer or flavoured a pie. As to its being the type of matrimonial perfection, we have only to recollect for half a moment, and we recall to mind one of the most savage animals that ever wore fangs or talons—the butcher bird; and again, the ravening eagle; and, once again, the ominous, croaking raven; each of which, as regards constancy and conjugal affection, will bear comparison with the gentlest turtle that ever coo'd. However, as before stated, the present generation are not responsible for the turtle dove's fame; we find the bird in question pretty and well-behaved, and these surely are credentials sufficient to ensure, at least, a kindly toleration in this rough-and-tumble world to their possessor.

It is the smallest of our native doves, and is found throughout temperate Europe and Asia. They arrive in this country about the beginning of May, breed here, and leave again early in autumn. They measure about ten or eleven inches in length, and about eighteen inches in breadth from tip to tip of the expanded wings; the beak is long and thin, measuring about three quarters of an inch, and dark horn-coloured; the coverings of the nostrils reddish-white; the irides of the eyes a bright orange-red, and the edges of the eyelids form a reddish thread-like circle round the eyes; the feet and toes are a deep red, and the nails dull black. The general colour of the plumage is a rufous-brown, having an ashen-grey tinge in the male, and varying in depth of colour in different parts of the body; on each side of the neck is a square black spot, some of the feathers forming it have white tips, which give it a pretty chequered appearance; the covert feathers of the wings, too, are black, bordered with rufous-brown, which also add to their beauty; the pinion feathers are dark; the tail long in proportion to the bird, the two centre feathers of a rufous-brown colour, the others of a slaty-black, tipped with white, the outer feathers having a white margin; those large white spots form a half-circle on the spread tail as the bird flies; the belly and under tail coverts are white. The young ones do not have the spots on the neck till the first moult, and are more of a uniform brown colour. The slender neck, round, plump form of body, and large tail, give the turtle dove a very elegant appearance.

The food of the turtle dove consists chiefly of seeds, such as corn, peas, and rape. In its wild state, it is an exceedingly shy bird, confining itself to the depths of the forest, where it builds a nest on the forked branch of a tree, usually about ten

feet from the ground. Its eggs can but with difficulty be distinguished from those of the wood pigeon, but they are rather more pointed. It seldom produces more than one brood in the year, or more than two young at a brood. It may not be superfluous to add, that the turtle dove must be regarded strictly as a cage bird. It does not seem to be susceptible of that attachment to its home which distinguishes the common or dovecote pigeon, and will almost certainly take advantage of the door of its cage or aviary being left open to escape, no more to return.

THE RING DOVE.

This, the largest of our native doves, is also known as the Ring Pigeon, Cushat, Wood-Queen, and Great Wood Pigeon. It is widely disseminated throughout Europe, either as a permanent resident, or as a periodical visitant. Its general plumage is of a dark ashy-grey; on each side of the neck is a half-moon-shaped white spot that nearly encircles the neck, from which circumstance they derive the name of Ring Dove; across the middle of the wing there is also a white mark, formed by the covert feathers of that part, which are white, so that when the wing is closed the lower edge appears white; the breast has a violet brown tinge; the neck is glossed on the sides, but not so much as is usual with the house pigeons; the flight feathers are a dull black, having a narrow white edge; the tail is dark slate-coloured, having a black bar at the extremity, with a light, ashy-grey band across the centre, on the under side of the feathers; the belly is dull white; the beak is a little more than an inch long, of the same form, but rather stouter than a common pigeon's, of a delicate flesh colour, and about the nostrils of a red colour, the coverings of which are white; the irides of the eyes are an opaque white or pearl colour; the feet, or shanks, are short, of a dull red, the feathers covering about half their length; the toes rather long and well adapted for perching; the nails dark horn-coloured; from the tip of the beak to the end of the tail they

RING DOVE.

measure about seventeen inches, and from tip to tip of the expanded wings twenty-nine inches.

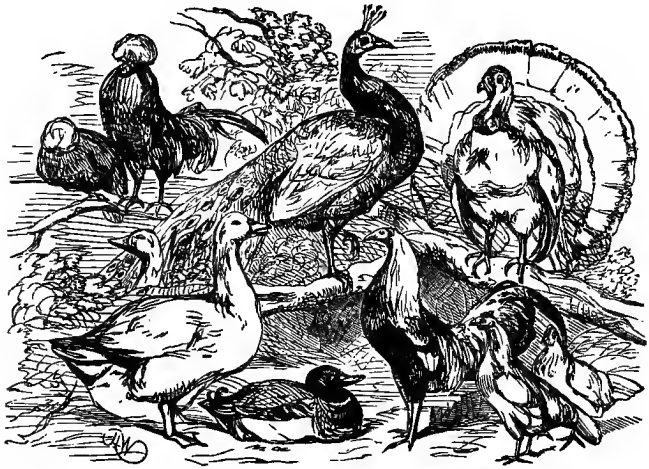
Various attempts have been made to domesticate the ring-dove, but hitherto without much success. Not only do they decline to breed with our common pigeons, but it is very rare that they will produce a brood among themselves. After a few weeks' confinement they appear to be thoroughly tamed, but should an opportunity occur they cannot resist the invitation of liberty, and though they may for awhile hover about your premises, will seldom come close enough to be recaptured.

THE STOCK DOVE.

It would seem that the name given to this bird, and which is derived from the circumstance of its building its nest in the stocks or stumps of trees, has led to the erroneous idea that it is to this bird that the whole tribe of pigeons owe their origin. In size it is about the same as a common pigeon. The beak is about an inch long, dove-shaped, and of a whitish flesh-colour, having a purplish tinge at the nostrils. In the young the beaks are at first dark horn-coloured, but become white as they gain maturity; the forehead is full and rounded; the iris of the eye dark brown; the neck is shorter and thicker in appearance than the common pigeon's; the shanks are short and dull red, feathered slightly over the hocks; the toes flexible, and the nails black. There are two black spots on the wings, which do not run across the wings in two distinct bars as in most blue house pigeons; the rump is greyish-blue; the tail barred with black at the extremity; and has the light band across the underside of the feathers like the ring-dove; and the marginal edge of the outer tail feathers is not so white as in the tame pigeons; in other respects they differ much from the house-pigeons.

If taken from the nest within a fortnight of being hatched it is possible to tame them, but to tame an adult wild stock-dove would be about as easy as domesticating a water-rat. Placed with other pigeons with whom they have been reared from the nest, they will settle comfortably enough till the autumn, and the season for migrating approaches, and then off and away never to return.

THE POULTRY YARD, THE DUCK POND, AND THE PIGEON HOUSE.



DOMESTIC POULTRY.

THEIR STRUCTURE.

Under the term Domestic Poultry are included three distinct orders of the class *Aves*. The first is the *rasore*, or gallinaceous birds, the type of which is the common fowl. This order is distinguished by having a rounded, heavy body, covered with loose feathers, which sometimes, on the neck and rump, assume the character of plumes or hackles; by having the wings short, round, and concave underneath. The latter members are by no means so useful for the purpose of locomotion as the legs; for short distances, rasorial birds fly tolerably swift, but, as a rule, are more at home on *terra firma*. Indeed, the legs of the fowl are well adapted for constant use, being remarkably strong and firm. The thighs are very powerful, and the tendons of the muscles are of an osseous nature. The *tarsi*, or shanks, are prolonged and stout, and covered with hard scales. In some species, these are armed with a spur—occasionally a

double spur occurs; in the females, also, the spur often is considerably developed. Of toes, they possess four, one of which is seated high up on the tarsus, and little used in progression; the other three are united at their base by a short membrane, and covered above with scales, the under part being protected by hard granulations. The claws are extremely hard, and particularly suited to the bird's mode of living—enabling it to dig and scratch up the earth in search of its food, which consists principally of seeds, roots, and insects. It may be imagined, from seeing a fowl at roost, that these claws have considerable grasping powers; but in fact they do not hold very tenaciously. The real secret of the fowl resting so securely consists in the nicely-balanced body, which of course greatly facilitates the bird's equilibrium. In many of the rasores we find the head furnished with naked membranes, taking the form of a comb; also with wattles on the cheeks or over the eyes. The beak is strong and stout, the base of which, in some species, is surrounded by a naked membrane; in others, the top of the head is provided with a crest of feathers, and sometimes with an helmet. The digestive organs of the gallinaceous birds are very curious, and worthy of particular observation, as success in rearing poultry depends greatly upon proper feeding; and this cannot be correctly understood, unless we are acquainted with the character of the organs which receive the food. Many a fowl is lost through the crop becoming over-gorged with grain, through a lamentable ignorance either of its ailment or the cause.

When the fowl receives its food, it passes from the œsophagus or gullet into a more extended cavity, which is called the crop, or *ingluvies*; this is situated near the breast-bone. It is furnished with several glands, which exude the mucous and salivary matter used in softening the food. Sometimes this crop will be over-distended with grain, and in such a case a very simple and speedy remedy may be applied. This is merely to cut it open with a sharp penknife, and thus relieve the poor bird, and perform a kind action for Nature, who will speedily heal the wound which you inflict, as the crop is by no means of a sensitive character. From the crop the food passes into a narrower portion, scientifically termed *ventriculus succenturiatus*, the lining membrane of which is covered with glandular orifices; these are said to pour out a copious secretion of gastric juice into the food in the gizzard, which immediately succeeds the *ventriculus succenturiatus*. This is the most remarkable of the

digestive organs—and, in fact, forms a wonderful grinding-mill. The gizzard is composed of numerous powerful muscles, and is lined with a membrane of a tough, leathery nature.

The grinding is performed by two large and thick hemispherical muscles, opposed to each other, and working in the same manner as two millstones; these reduce the grain to a certain consistency, after which the gastric juices take up the dissolving process and finish the digestion of the food. To assist in the grinding, the birds swallow numerous small stones or pebbles; these are, of course, absolutely essential to the existence of fowls. Sir Everard Home, in his "Comparative Anatomy," makes the following observations on the gizzard of the turkey:—

"When the external form of this organ is first attentively examined, viewing that side which is anterior in the living bird, and on which the two bellies of the muscle and middle are more distinct, there being no other part to obstruct the view, the belly of the muscle on the left side is seen to be larger than on the right. This appears, on reflection, to be of great advantage in producing the necessary motion; for if the two muscles were of equal strength, they must keep a greater degree of exertion than is necessary; while in the present case, the principal effect is produced by that of the left side, and a smaller force is used by that on the right to bring the parts back again.

"The two bellies of the muscle, by their alternate action, produce two effects,—the one, a constant friction on the contents of the cavity; the other, a pressure on them. This last arises from a swelling of the muscle inwards, which readily explains all the instances which have been given by Spallanzani and others, of the force of the gizzard upon substances introduced into it—a force which is found by their experiments always to act in an oblique direction. The internal cavity, when opened in this distended state, is found to be of an oval form, the long diameter being in the line of the body; its capacity nearly equal to the size of a pullet's egg; and on the sides there are ridges in their horny coat (lining membrane) in the long direction of the oval.

"When the horny coat is examined in its internal structure, the fibres of which it is formed are not found in a direction perpendicular to the ligamentous substance behind it; but in the upper portion of the cavity they have a direction obliquely upwards.

"From this form of cavity it is evident that no part of the

sides is ever intended to be brought in contact, and that the food is triturated by being mixed with hard bodies, and acted on by the powerful muscles which form the gizzard."

Numerous experiments, some of them not of the most refined nature, have been made to test the extraordinary solvent powers of the gizzard. Spallanzani, Magallo, and other men of science, have administered bullets, stuck over with needles, by way of rendering them digestible, and they have afterwards been found broken into pieces and partly ground into powder. Other ingenious naturalists have for a time fed their fowls on glass, and even this has been found smoothed and rounded. A more extravagant theorist gave his hen a louis d'or, who returned it him minus some sixteen grains in weight. The same gentleman (utterly disregarding the moral injunction not to cast pearls before swine), also, on another occasion, tried the effect of a fowl swallowing an onyx, and found, in four days, that the bird's gizzard had diminished the value of his gem one-fourth. Notwithstanding the success of these experiments, I earnestly advise every owner of poultry not to be deluded into trying their innocent hands in any such unprofitable business. Glass is not nearly so good a diet as barley!

THE ORIGIN OF DOMESTIC FOWL IN BRITAIN.

At what period of the world's history renowned Chanticleer condescended to quit his native wilds and become *gallus domesticus*, no authority, ancient or modern, pretends to declare. It is certain, however, that hens "clucked" in ancient Rome, and that the crowing of the cock was familiar to the Athenians. Indeed, when Themistocles, the Athenian king, went to war with the Persians, he took advantage of the fighting of two old chickens attached to the camp, to harangue his troops, with the view of inspiring them with some of the valour of the too-pugnacious bantams. I wonder what would be the effect, if Field Marshal the Duke of Cambridge were to choose such a subject for haranguing the Scots Fusileers!

He has been a bird of note from the most remote periods. Several allusions are made to him in the Old Scriptures: a most pertinent one, for instance, in Nehemiah, who lived about four hundred and fifty years before Christ. He says:—"Now that which was prepared for me daily was one ox and six choice sheep; also fowls were prepared for me." The ancient Greeks practised divination through the medium of the cock-

bird—the process being curiously similar to that observed in the case of the modern Learned Pig. The letters of the alphabet were arranged in a circle; on these were placed a grain of wheat or barley; and a cock, consecrated or provided for the occasion, was placed within the circle. The required information was obtained by placing together those letters from which the bird had pecked the ears of corn. On one occasion, however, a person inimical to priestly interest, officiously examined the grains, and found that those lying on the letters which were not wanted, were made of wax. It is needless to add that, after this, divination—at least through the medium of cocks and grain—fell out of fashion.

Only one degree less cruel than cock-fighting, was the ancient and popular sport of *cock-shying*. Thank goodness it is an affair of the past, and as every boy knows, anything in these days to be thrown at with a view to dislodging it, is termed a cock-shy. But there was a time when at fairs, and other joyful congregations, a real *live* fowl, tied by the leg to a stick, was set up as a mark for brutal bipeds to fling at with sticks and stones. It was "a penny a shy;" and as the poor frightened chicken fluttered considerably, it was by no means an easy matter to hit it. He, however, who was able to accomplish his laudable intention, and struck the bird dead, received the carcass as his reward; if he merely lamed it—broke a leg or a wing, or staved in a few ribs, maybe—he received a groat. Good old times!

The only explanation as to the origin of the pastime is to be found in the works of an old German writer named Cranenstien. He informs us that while the Danes were masters of England, their behaviour to the natives grew so cruel and outrageous that the oppressed Britons formed a conspiracy, and resolved at one stroke to sever the throats of the tyrants and their own bonds. Shrove Tuesday morning was the time appointed for the execution of the sanguinary design. The town-hall was to be entered by stratagem, the guards surprised and slain, the arms appropriated, and then the carnage was to begin, and to be carried out with the utmost neatness and dispatch. They had reckoned, however, without their host, or rather, without *the roost*, for while they were stealthily gathering in the street preparatory to investing the town-hall, the watchful cocks of the neighbourhood were aroused on their perches, and set up such a crowing as speedily awoke the devoted Danes. Thus was the conspiracy frustrated and the

conspirators made to suffer for their abortive attempt at wholesale murder. The brave Britons, however, were not to be entirely baulked of their revenge. They treasured up their spite against their dunghill betrayers till the Danes were, in their turn, beaten and made to flee; and then they inaugurated the institution ever after known as "cock-shying," and ever after upheld manfully on the anniversary of the betrayal of the conspiracy.

For the sake of ancient English valour and chivalry, I hope that the legend has no sounder foundation than the imagination of the old German writer Cranenstien.

As to the origin of the introduction of the domestic cock into Britain, we are unable to fix the precise date. When Julius Cæsar invaded the country, he found both the goose and fowl in a state of domestication; and they seem to have been held in some kind of religious reverence, as they were forbidden to be eaten. It is common all over the world; and it is very singular that the common fowl, in every way resembling that of our own country, was found domesticated amongst the South Sea Islanders when first Europeans visited them.

The Game Cock we seem to owe to the Romans, as there is no instance on record of cock-fighting being practised by the ancient Britons. It is very probable that while the Romans remained in the conquered country, certain of the game breed were sent over for their amusement, and hence cock-fighting became an institution of the country. Several choice breeds were kept by the ancient Greeks, Medians, and Persians. The anecdote of Themistocles, the Athenian king, who flourished two thousand years ago—already given—shows that they were common amongst the Athenians. What he then remarked of the two fighting-cocks in his camp may at the present time be equally applicable to our own specimens of the species. To this day its courage has not degenerated. The bird still preserves his bold and elegant gait, and his sparkling eye, while his wedge-shaped beak and cruel spurs are ever ready to support his defiant crow. It is no wonder that the breed is not plentiful; —first, on account of the few eggs laid by the hen; and secondly, from the incurable pugnacity of the chicks. Half-fledged broods may be found blind as bats from fighting, and only waiting for the least glimmer of sight to be at it again.

The fighting of cocks, however, survived the practice of "shying" at them by many years. No barbarism, ancient or modern, was ever more favourite or more universally patronized.

The costermonger kept his cock, and fought it for a crown against the one owned by his neighbour the sweep; and Lord Noodle kept his cock, and fought it for fifty pounds against my Lord Boodle's, in the cock-pit at Westminster. The practice was even defended, or at least excused, by writers who, if they will pardon me, ought to have known better. Even that humane and creditable writer, Bonington Mowbray, goes out of his way to admire the ruffianly "sport." He says,—

"Philanthropists are in the habit of declaiming much against the practice of cock-pit battles; but, on reflection, the cruelty of that sport will be found to be among the least wherein the feelings of animals are concerned, since fighting, in the game cock, is a natural and irresistible passion, and can never take place against his will, and since those engaged in combat upon the arena would do so voluntarily, and with equal ardour, did they meet in the desert. Another and a similar mistake is the supposed additional cruelty of arming the heels of the cock with steel, which, on the contrary, conduces to shorten the period of their sufferings."

If the first part of Mr. Mowbray's argument is sound, why then, for the delectation of folk of sanguinary mind, let us revive bull-baiting and dog-fighting, and the imperial Roman pastime of setting tigers and lions by the ears. They are all "animals of irresistible passions." Let us even give our countenance to that remaining relic of ancient barbarism, man-fighting. But the argument is not sound. Will the dog worry the bull if not hounded on by his master? Do bears and lions, in private life, continually give their minds to growling and fighting? No. In spite of Doctor Watts's testimony to the contrary, I insist it is not so: no more than Mr. Sayers will enter the prize-ring unless a substantial sum is to be his reward for beating his antagonist to jelly. With regard to the desirability of arming the heels of the birds with steel spikes, "because they conduce to shorten the sufferings" of the poor creatures, comment would be an insult to the reader.

I have had some conversation lately with a person whose father was a breeder of game cocks, and he assures me that to prepare a bird for the pit the utmost care was required. He was fed on the richest food, made to take so much exercise each day, his limbs were bathed once a day, and his beak *sand-papered* to needle-like sharpness. He related that on one occasion he was present at a cock-fight at Birmingham, where one celebrated fighting bird was pitted against five others. They

were let at him one at a time, and one at a time the valorous bird beat four out of his five antagonists. His great exertions, however, left him in a pitiable condition, so that his fifth and last enemy, on entering the pit, found him lying on his side, quite worn out. His pugnacity, however, was by no means subdued. He allowed the new comer to approach, even to flap his wings and crow over his bloodless victory; and then, still prostrate, he struck out with his terrible steel-tipped heel, piercing the brain of his last adversary. The savage stroke, however, cost him his life, and both birds were taken up dead.

He likewise told me the terrible story of John Ardesoif, who, in the spring of 1789, fought his game cock, "Hercules," against another. Hercules, however, declined to fight, which so infuriated the wicked Ardesoif that he swore a terrible oath to roast the recreant cock alive. He even proceeded to execute his diabolical threat, and, when interfered with, became a raving madman, and fell down dead!

No one will dispute that for beauty, animation, plumage, and courage, the bantam is entitled to rank next to the game-fowl. The bantam is undoubtedly a descendant of the Banksia Jungle-fowl of Java, to which bird it bears a strong resemblance. In 1608 the English erected a factory at Bantam in Java, which was our first possession in the East Indies. While there, the natives brought, and sold to the British, several specimens of the wild-fowl above-mentioned, which were much admired for their liliputian-like elegance, and were sent to England under the appellation of bantam-fowl. They soon became great favourites here, and the name, which was at first exclusively given to these birds was, after a time, given to all domestic and dwarf fowls. The choicest sorts are the buff-coloured, and those that are entirely black. A year-old bantam cock of pure breed will not weigh more than sixteen ounces. Despite its small size, however, it is marvellously bold, especially in defence of its progeny. A friend of the writer's, residing at Kensington, possessed a pair of thorough-bred bantams, that were allowed the range of a yard where a fierce bull-terrier was kennelled. The hen had chicks; and, when about three weeks old, one of them strayed into the dog-kennel. The grim beast within

BLACK BANTAMS.

took no notice of the tiny fledgeling; but, when the anxious mother ventured in to fetch out the truant, with a growl the dog woke, and nearly snapped her asunder in his great jaws. The cock bird saw the tragic fate of his partner; but, nothing daunted, flew at the dog with a fierce cry, and pecked savagely at its face. The odds, however, were too great; and, when the terrier had sufficiently recovered from the astonishment caused by the sudden and unexpected attack, he seized the audacious bantam, and shook him to death; and, in five minutes, the devoted couple were entombed in Pincher's capacious maw.

There are now several varieties of the bantam fowls, many of which are but slight improvements upon the original; and some have certainly degenerated in the attempt to improve the stock. In the selection of these we shall presently give the reader some useful information.

The origin of the Dorking Fowl has been the subject of much discussion and controversy. Some supposed that the Poland fowl could lay claim to its parentage; on the other hand, the men of Sussex stoutly maintained that the bird belonged to them, and that it was a distinct species; and in proof thereof, produced several birds indigenous to their weald, which possessed all the fine points and peculiarities of the Dorking. It takes its name from that of a town in Surrey, and it is commonly believed that this branch of poultry was found at Dorking as long ago as the Roman era.

The Brahma Pootra fowl was, it is said, introduced into England, somewhere about nine or ten years ago. Of its origin little or nothing is positively known. It was brought to this country from America, and to the latter country from India. They were brought to New York by some sailors, and immediately created a great sensation, and fetched large prices. Some have reported them to have come from the neighbourhood of the river in India, from which their name is taken; another authority states that he saw the birds in Ceylon. When they were first introduced, it was supposed by some to be only another variety of the Cochin-China fowl, but as there is a total dissimilarity between the two, both in their structure and habits, this ill-founded conclusion has been abandoned. Still their origin is as much a matter of doubt as formerly. Perhaps, it suffices that the bird is a hardy, useful fowl, and more easily reared than many others, and that its native home is a matter of little consequence so long as we have obtained so important an addition to our domestic poultry.

Another important member of the poultry-yard is the Spanish fowl, which, as its name indicates, was imported from Spain. He is a proud, gallant-looking bird, and is generally a favourite. The only drawback in rearing these fowls is the delicacy of the young chicks, which renders it necessary to be very careful in bringing them up. There are several varieties of the Spanish fowl, of which we shall presently treat.

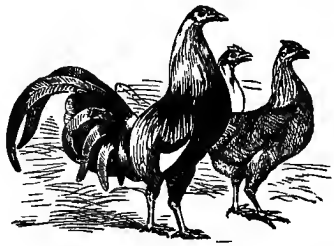
Of all the breeds of fowls, none has ever created so great an excitement as the Cochin-China. Its introduction to this country was the signal for a mania more closely resembling what might be rather expected of the landing of a French host than of an over-grown, ill-shaped specimen of poultry. In the year 1846, the first pair that was brought to this country from Shanghai were presented to the Queen, who exhibited them at the Dublin poultry show. Immediately the "Cochin" *furore* commenced. As soon as it was discovered, despite the most strenuous efforts to keep the secret, that a certain dealer was possessed of a pair of these birds, straightway the avenues to that dealer's shop were blocked by broughams, chariots, and hack-cabs, until the sly poulterer had been tempted by a sufficiently high sum to part with his treasures. Bank notes were exchanged for Cochin chicks, and Cochin eggs were in as great demand as though they had been laid by the fabled golden goose. Philosophers, poets, merchants, and sweeps, had alike partook of the mania, and although the latter could hardly come up to the price of a real "Cochin," there were plenty of vagabond dealers about, with counterfeit birds of all kinds, which were advertised to be the genuine article. For to such a pitch did the excitement rise, that they who never kept a fowl in their lives, and would hardly know a bantam from a Dorking, puzzled their shallow brains as to the proper place to keep them, and the proper diet to feed them on. An acquaintance of mine related to me an anecdote, connected with the "Cochin" mania, in which the interest of a whole family were involved, and the nicely-balanced order of the household shockingly disturbed by the *entrée* of one of these formidable birds.

In the year 1846 (he says), he was living at the west end of London, with an uncle, a retired merchant, who had amassed a considerable fortune in the opium trade. He was a man of great shrewdness, and one who prided himself on never being "taken in" all his life. He visited the Dublin poultry show that year, and was, in common with others, greatly fascinated

with the appearance of the Cochin-China visitors, and he resolved to have a pair. He had to pay a large price—something like twenty guineas—but the purchase was, not without some difficulty, at last made, and the precious treasures conveyed to his residence in a large wicker-basket. The next day the fowl-house was erected by the carpenter, and taken possession of by the two ungainly birds. Prior to this arrangement, however, there was a very animated discussion about the propriety of putting them into a fowl-house at all. One member of the family suggested that perhaps it was a house-bird, and ought to have a cage like a starling or canary; another small branch thought they were to run about the house as the cat or dog, and what a "lark," said he, "it will be with them and 'Tim'"—a favourite canine friend of his. Papa's decisions ultimately ruled all opposition; there was no doubt they were fowls, and should be treated accordingly. Such was the last bulletin received by the servants; and forthwith a carpenter was engaged to erect the birds a domicile, The next thing to be decided was, who was going to look after them. This was quite as much a subject of discussion in the kitchen as in the parlour; indeed, to such a pitch did they arrive in the latter quarter, that the servants, one and all, protested against having anything to do with the "narsety furrin creatures!" and uttered hurried threats of at once leaving the house if they were requested to so demean themselves. My friend says, that just at this critical time, the subject of engaging an extra hand in the capacity of page, was mooted at the breakfast-table one morning, and was, after some little discussion, agreed to. There seemed to be a tacit understanding between his aunt and uncle about this arrangement; it was not so much that a page was required as some one to look after the "Cochins." Forthwith, a respectable youth was engaged, and the secret of his employment imparted to him. From the very first morning of his arrival, a visible change took place in the birds;—whether the livery of their keeper (bright blue, with yellow lace and gold buttons,) was offensive to the Cochins, or the behaviour of the page was not of the most amiable kind, my friend says he cannot determine. They grew morose, sullen, and even spiteful; pecked at his hands while giving them their food, and one morning fairly knocked him on his back while engaged in cleaning out their house. At last, things grew so bad, that he was obliged to arm himself with a broom whenever he went near them. They would chase him

round and round the garden, and seemed to enjoy the fun mightily. Poor Thomas was oftentimes nearly driven mad with their obstreperous behaviour; and, says my unmerciful friend, he has often had a hearty laugh at the poor lad's expense, for very often he was so hardly pressed by the birds, that he had nothing to do but to stand with his back to the wall and shove them away with the broom. But one day—the birds being unusually wild, and attacking the page in a most furious manner—the poor fellow was so frightened that he jumped over the garden wall, and, unfortunately, alighted on a rusty spade on the other side, bruising himself in a most severe manner. After this little episode, my friend's uncle—hitherto stoically indifferent to his poor page's sufferings, and blindly enamoured of the beautiful Cochins—was aroused from his apathy, and determined to sell them at once, which he accordingly did, to the unbounded joy and unfeigned pleasure of the wretched Thomas.

SPECKLED HAMBURGS.



GAME FOWLS.

VARIETIES: THEIR CHOICE AND MANAGEMENT.

In the choice of fowls, no inconsiderable amount of knowledge of the characters of the different varieties is necessary to insure success to the amateur breeder. From my own experience, and that of the most eminent poultry-keepers, I have attempted to jot down such information as may be found useful in the selection and management of these really useful and elegant pets, and moreover, prevent any honest, but ignorant, person becoming amenable to the laws so rigidly enforced by the "Society for the Prevention of Cruelty to Animals," through a lamentable misuse of the creatures under their control.

The Game Fowl justly claims notice. All breeders are unanimous in their opinion of this splendid species, and good authority says:—"It is not only for its pugnacious qualities that the game fowl is to be noticed. It yields to no breed,—nay, perhaps is superior to most in the whiteness and solidity of its flesh; the hens are excellent layers, and the eggs, though of moderate size only, are remarkable for the delicacy of their flavour. The game cock is very attentive to his female train, and ever ready to do battle in their defence." Notwithstanding the game varieties advantage in so many points over the rest of the family, one of its noblest traits—its high spirit—is often a source of great trouble and loss to its possessor. Such an announcement as the following, which I found in an old newspaper, is certainly very discouraging to those who are ambitious of keeping fowls. "Mr. Johnson, a farmer in the west riding of Yorkshire, and who has a famous breed of the

game fowl, has had the great misfortune to lose his little son, a boy of three years' old, who was attacked by a game cock, and so severely injured that he died shortly afterwards." The writer before quoted says:—"Size is not a point of merit in the game fowl; the cocks weigh three and a half pounds and upwards, and the hens are in proportion. When in good condition, the plumage is hard, crisp, close-fitting, and glossy." Another well-known breeder gives us the following rules to be observed in the selection of this species. Of these fowl, he says:—"The hen's head should be long, mandible very strong and fairly set in the head, eyes very prominent, neck long and graceful, square shoulders, broad chest, point of wings almost meeting under the tail,—the latter adornment must be close and compact, not carried too erect or loose over the back,—thigh short and muscular, legs long and free from feather, toes well spread, feathers short and hard. These are the points of a good game hen. We now come to her mate, the game cock. Some breeders fancy one weight and some another; but I prefer *my* stock-bird of about five or six pounds weight. Choose a bird of bold, defiant carriage, of good colour, head long and slender, mandible strong, curved and well set in the head, very stout at the base, full breast, round body, broad between the shoulders, and tapering to the tail. In fact, he must resemble the hen in all points, except in colour."

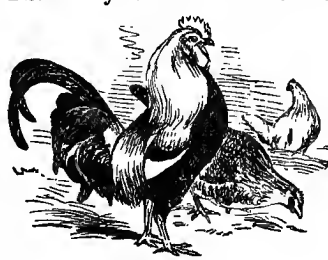
Since the introduction of the bantam into Europe it has ramified into many varieties, none of which are destitute of elegance, while some, indeed, are remarkably beautiful. All are, or ought to be, of small size, but lively and vigorous, exhibiting in their movements both grace and stateliness. The feather-legged bantam is remarkable for the *tarsi*, or beams of the legs, being plumed to the toes with stiff, long feathers, which brush the ground. Owing, possibly, to the little care taken to preserve this variety from admixture, it is now not frequently seen. Another variety is often red, with a black breast and single dentated comb. The *tarsi* are smooth, and of a dusky blue. When this sort of bantam is pure, it yields in courage and spirit to none, and is, in fact, a game-fowl in miniature, being as beautiful and graceful as it is brave. A pure white bantam, possessing all the qualifications just named, is also bred in the royal aviary at Windsor.

Above all bantams is placed the celebrated and beautiful breed called Sir John Sebright's silver bantams. This breed, which Sir John brought to perfection after years of careful

training, is very small, with unfeathered legs, and a rose comb and short hackles. The plumage is gold or silver, spangled, every feather being of a golden orange, or of a silver white, with a glossy jet-black margin; the cocks have the tail folded like that of the hen, with the sickle feathers shortened straight, or nearly so, and broader than usual. The term *hen-cocks* is, in consequence, often applied to them; but, although the sickle feathers are thus modified, no bird possesses higher courage, or a more gallant carriage. The attitude of the cock is, in truth, singularly proud; and he is often seen to bear himself so haughtily, that his head, thrown back as if in disdain, nearly touches the two upper feathers—sickles they can scarcely be called—of his tail. Half-bred birds of this kind are not uncommon, but birds of the pure breed are not to be obtained without trouble and expense; indeed, some time ago, it was almost impossible to procure either a fowl or an egg. "The finest we have ever seen," says the writer whom we have consulted as to this breed, "were in Sir John's poultry-yard, adjacent to Turnham-Green Common, in the byroad leading to Acton."

SEBRIGHT BANTAMS.

We have already alluded to the mystery which enshrouds the origin of the DORKING fowl; that we *do* possess so useful a member of the poultry-yard is, perhaps, sufficient to satisfy most people, without diving into musty records to trace the worthy bird's pedigree, for the purpose of finding what kind of animal his progenitor was. It has good claim to be considered a genuine British bird, and displays its nationality by its great love of liberty. Consequently, it is essential that the keepers of Dorkings must provide a good long *run* for the chickens, which must be on clay or gravel soil, but never on wooden or brick floors. If this particular is carefully attended to, the chickens will



DORKINGS.

thrive and grow well; but otherwise, as they are very delicate, no success with this breed can be attained. The constitution of the Dorking is more incidental to disease than many other varieties, more especially is it subject to *croup*. The remedy usually prescribed in the latter case is to mix the fowl's food with ale or beer, and a small quantity of cayenne pepper. Of this species there are two kinds,—the white Dorking and the coloured. The former is the favourite bird of old fanciers, and a writer in the *Poultry Chronicle* makes the following remarks on this breed:—"The *old* Dorking, the *pure* Dorking, the *only* Dorking, is the White Dorking. It is of good size, compact and plump form, with short neck, short white legs, fine toes, a full comb, a large breast, and a plumage of spotless white. The practice of crossing with a game cock was much in vogue with the old breeders, to improve a worn-out stock (which, however, would have been better accomplished by procuring a fresh bird of the same kind, but not related); this cross shows itself in single combs, loss of a claw, or an occasional red feather, but, what is still more objectionable, in pale yellow legs, and a yellow circle about the beak, which also indicate a yellowish skin: these, then, are faults to be avoided. As regards size, the white Dorking is generally inferior to the Sussex fowl (or 'coloured Dorking'), but in this respect it only requires attention and careful breeding."

Another good authority says,—"I find the white Dorkings hardy—quite as prolific as the coloured: they lay well, and are excellent sitters and mothers." The coloured Dorking is a handsome bird, and in high esteem at all exhibitions of poultry. Of their breed, the writer before quoted (the champion of the white species) remarks,—"To the breeders and admirers of the so-called 'coloured Dorkings' I would say, continue to improve the fowl of your choice, but let him be known by his right title; do not support him on another's fame, nor yet deny that the rose comb or fifth toe is essential to a Dorking, because your favourites are not constant to those points. The absence of the fifth claw to the Dorking would be a great defect, but to the Sussex fowl (erroneously called a 'coloured Dorking') it is my opinion it would be an improvement, provided the leg did not get longer with the loss."

The real SPANISH FOWL is recognized by its uniformly black colour, burnished with tints of green; its peculiar white face, and the large development of its comb and wattle. The

hens are excellent layers, and their eggs are of a very large size. They are, however, bad nurses; consequently their eggs should be placed in the nest of other varieties to be hatched. The Dorking is the most suitable for this purpose, the hens of this species remaining longer with their chicks than any other. "In purchasing Spanish fowls," says an authority, "blue legs, the entire absence of white or coloured feathers in the plumage, and a large white face, with a very large high comb, which should be erect in the cock, though pendent in the hens, should be insisted on." The flesh of this fowl is esteemed; but, from the smallness of its body when compared with that of the Dorking, it is not placed on an equality with it for the table. Otherwise, however, they are profitable birds, and their handsome carriage, and striking contrast of colour in the comb, face, and plumage, are a high recommendation to them. For a town fowl, they are, perhaps, better adapted than any other variety.

BLACK SPANISH.

The HAMBURG FOWL is a very useful and important denizen of our poultry-yard. The hen lays nearly every day until the moulting season; hence they have obtained the name of "everlasting layers;" but they very seldom sit. This, in all probability, is owing to their confined condition in this country, for it is said that when the birds have a free woodland range, they frequently set themselves to the task of incubation with as much diligence as other fowls. Mrs. Blair says,—"If not interfered with, like the pheasant, in a fine season the hen will rear all her brood, but like her, is quite dependent on weather. If confined to a yard, I have never found the Hamburg sit; and their range, even if free, must be *wild*, to induce a desire to perpetuate her species."

PENCILLED HAMBURGS.

Of this fowl we have three varieties. The first is the PENCILLED HAMBURG, which is of two colours, golden and silver, and is very minutely

marked. The hens of both should have the body clearly pencilled across with several bars of black, and the hackle in both sexes should be perfectly free from dark marks. The cocks do not exhibit the pencillings, but are white or brown in the golden or silver birds respectively. Their form is compact, and their attitudes graceful and sprightly. In addition to their common appellative, they are also known in different parts of the country, as chitteprats, creoles, or corals, Bolton bays and grays, and, in some parts of Yorkshire, by the wrong name of Corsican fowls. They are imported in large numbers from Holland, but those bred in this country are greatly superior in size.

Of the SPECKLED, or SPANGLED HAMBURG, which is a favourite breed with many persons, there are two kinds—the golden-speckled and the silver-speckled. The general colour of the former is golden, or orange-yellow, each feather having a glossy dark brown or black tip, particularly remarkable on the hackles of the cock and the wing-coverts, and also on the darker feathers of the breast. The female is yellow, or orange-brown, the feathers in like manner being margined with black. The silver-speckled variety is distinguished by the ground colour of the plumage being of a silver-white, with perhaps a tinge of straw-yellow, every feather being margined with glossy black. Both of these varieties are extremely beautiful, the hens laying freely. First-rate birds command a high price.

A third variety is the BLACK HAMBURG, the plumage of which is a beautiful black with metallic lustre. It possesses the twofold advantage of being a noble-looking bird and an exceeding good layer. On the whole the Hamburg is a capital fowl, and one which is deservedly highly valued. To the young poultry-keeper, I especially recommend this bird; it has a good robust constitution, and the purchaser is pretty sure to get his full equivalent of fowl for the price paid. It is true it is an expensive bird, but the purchase once made, it will cost little more, except for food, and the number of eggs it lays will repay the whole.

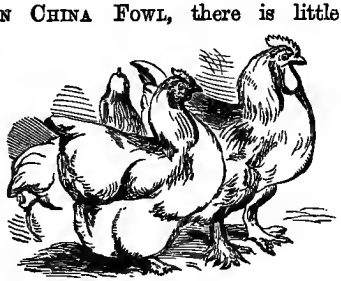
One of the greatest favourites of the fowl-keepers, especially those who have an eye to profit rather than to amusement, is the POLAND FOWL. The golden and silver Polands are the handsomest varieties of this bird. The plumage of the first is gold and brown, and the other black and white. The common black Poland is a less interesting-looking bird, but is quite as useful. Of this kind the most esteemed are those which are without a comb, and

possessing a perfectly white tuft on the head. Its great value lies in the number of eggs produced, indeed in many parts they are as well known as "everlasting layers" as by their proper name. However, the experienced breeder would take good care to send the eggs of his everlasting layers to market, and not use them for home consumption, as, although they may be as large as those laid by other hens, the amount of nutriment contained in them is not nearly so great. Mr. Mowbray once kept an account of the number of eggs produced by this prolific bird, with the following result:—

SPANGLED POLANDS.

From the 25th of October to the 25th of the following September five hens laid 503 eggs; the average weight of each egg was one ounce five drachms, and the total weight of the whole, exclusive of the shells, 50¼ pounds. Taking the weight of the birds at the fair average of five pounds each, we thus see them producing within a year double their weight of egg alone; and, supposing every egg to contain a chick, and allowing the chick to grow, in less than eighteen months from the laying of the first egg, *two thousand five hundred pounds* of chicken-meat would be the result. The Poland is easily fattened, and its flesh is generally considered juicier and of richer flavour than most others.

As regards the COCHIN CHINA FOWL, there is little doubt that it has several very good qualities, and, in fact, is a useful and important member of the poultry-yard. The same fowl—the same in every respect—that obtained so large a share of popular favour on its arrival in this country in 1846, is at the present day the subject of more ignorant ridicule than ever poor bird had to bear; and why? simply because the creature was



COCHIN-CHINAS.

found to be no better than it should, or nature intended it to be. A writer in the *Poultry Chronicle* says:—"These fowls were sent to provide food for man; by many they are not thought good table-fowls, but, when others fail, if you keep them, you shall never want the luxury of a really new-laid egg on your breakfast-table. The snow may fall, the frost may be thick on your window, when you first look out on a December morning, but your Cochin will provide you eggs.

"They are fallen in price because they were unnaturally exalted, but their sun is not eclipsed—they have good qualities and valuable. They shall now be within the reach of all, and will make the delight of many by their domestic habits, which will allow them to be kept where others would be an annoyance." "They have fallen in value as absurdly as they rose," says Miss Watts; "but they have been bred so completely with an eye to *mere fancy qualities*, that it is as difficult to get a really good well-formed cock or hen as when an absurdly high price was a bar to purchasing. A great hue and cry has been raised against them as fowls for the table, but I believe *none* have bestowed attention on breeding them with a view to this valuable consideration. Square, compact, short-legged birds have been neglected for a certain colour of feather, and a broad chest was given up for the wedge-form, at the very time that that was pronounced a fault in the fowl. It is said that yellow-legged fowls are yellow also in the skin, and that white skin and white legs accompany each other, but how pertinaciously the yellow leg of the Cochin is adhered to; yet all who have bred them will attest that a little careful breeding would perpetuate white-legged Cochins. Exhibitions are generally excellent, but to this fowl I think they have only been injurious by exaggerating useless and fancy qualities at the expense of those which are solid and useful. Who would favour, or even sanction, a Dorking in which size and shape, and every property we value in them, was sacrificed to an endeavour to breed to a particular colour? and this is what we have been doing with the Cochin-China."

The Cochin is a very hardy bird and a capital layer, giving us eggs when they are most expensive, and indeed, with regard to new-laid eggs, when they are almost impossible to be got at all. The chickens of such healthy fowls are, of course, easy to rear. A good Cochin should be compact and large and square-built, with a full chest and broad hinder quarters. In the "Henwife," a little work purporting to be a correct account of the

habits of domestic fowls, some useful information is given concerning the Cochin-China. "From her experience of this species," the "Henwife" says, "Cochins lay regularly, and, if not too highly fed, are productive of very fine chickens. The hens are more exemplary in their maternal duties, and from their abundance of soft and downy feather, are peculiarly adapted for the purpose of hatching. They enjoy the honour of maternity; their love of this task seems their idiosyncrasy. For them a mother's joys is 'blessed with those sweet cares,' &c." From a sea of poetry our author again emerges into the poultry-yard, and continues:—"This variety is very hardy, and may be kept in a smaller space than almost any other; *cockerels*, however, must have ample range, if intended to become superior specimens. It is remarkably free from liability to any disease, if well provided with green food, which is indispensable.

"I consider the Cochin a more beautiful bird, and capable of comparison with the most graceful and high-coloured of our poultry; its exquisite feathering and lovely tints, from the palest buff to deep orange, make this bird peculiarly the lady's own.

"All must appreciate its massive build, small head, rich, full hackle, and majestic carriage—true types of the high-caste Cochin."

A somewhat rare variety is the MALAY FOWL, which possesses many good qualities. It is a large, heavy bird, with long legs, which are stout and firm, enabling their owner to stand very erect; some specimens of this fowl have been known to measure over three feet in height, and weigh more than ten pounds. Crossed with the Spanish fowl, the Malay produces excellent birds for table. Like the game fowl, it is terribly pugnacious, and in its native home is specially trained for fighting. In captivity, it will assault its companions indiscriminately; and, it is said, that at exhibitions, "Before the show opens, and even before the judges have performed their duties, the committee are called in to keep the peace; the combatants are separated, and, instead of occupying decorated pens, each fowl, perhaps thrust into a spare pigeon-cage, stands in solitary wretchedness, looking as fowls generally do look after they have been fighting." The same authority informs us that—"I have heard an amateur relate how he has had his window broken by his Malay cock doing battle with his own reflection."

The BRAHMA-POOTRA has not long been introduced into this

country, and is found to be one of the most useful and hardiest fowls we possess. It is a good layer, a good setter, and a kind, attentive mother. The following directions, with regard to the choice of this bird, are recommended.

The Brahma should be a large and weighty fowl, of a free, majestic bearing, alike removed from the waddle of the Cochin-China and the upright carriage of the Malay; short in the leg and neck, wide and full in the breast, and wide and deep in make.

Legs, yellow and *well* feathered, but not smothered in feathers like the most admired specimens of Cochins.

Head, with a slight fulness over the eye, which gives a certain breadth to the top of the head. We admire a full pearl eye; but it is far from common.

Tail, short, but otherwise full in size and spread; that of the cock opening into a fan.

Comb, either a small single comb, or a pea-comb.

The latest species introduced into England is the SERAI TAOOK, or, *Fowl of the Sultan*. They arrived here in 1854; and Miss Watts, to whom they were consigned, gives their history as follows:—

"They were sent to me by a friend living at Constantinople, in January, 1854. A year before, we had sent him some Cochin-China fowls, with which he was very much pleased; and when his son soon after came to England, he said he could send from Turkey some fowls with which I should be pleased. Scraps of information about muffs, and divers beauties and decorations, arrived before the fowls, and led to expectations of something much prettier than the pretty ptarmigan, in which I had always noticed a certain uncertainty in tuft and comb.

"In January, they arrived in a steamer chiefly manned by Turks. The voyage had been long and rough; and poor fowls so rolled over and glued into one mass with filth were never seen. Months afterwards, with the aid of one of the first fanciers in the country, we spent an hour in trying to ascertain whether the feathers of the cock were white or striped, and almost concluded that the last was the true state of the case, although they had been described by our friend as *bellissimi galli bianchi*.

"I at once saw enough to make me very unwilling to be entirely dependent for the breed on the one sad-looking gentleman with his tuft heavy with dirt—dirt for a mantle, and his

long clogged tail hanging round on one side. I wrote directly for another importation, especially for a cock, and to ask the name they had at home In answer to the first request, I found that good fowls of the kind are difficult to get there; our friends have ever since been trying to get us two or three more, but cannot succeed either in Constantinople, or other parts of Turkey: the first he can meet with will be sent. With regard to the name, he told us they are called 'Sarai-Täook.' Serai, as is known by every reader of eastern lore, is the name of the Sultan's palace; Täook is Turkish for fowl; the simplest translation of this is, 'Sultan's fowls,' or 'fowls of the Sultan;' a name which has the double advantage of being the nearest to be found to that by which they have been known in their own country, and of designating the country from which they came.

"Time very soon restored the fowls to perfect health and partial cleanliness; but it was not until after the moulting-season that they showed themselves as the *bellissimi galli bianchi* described by our Constantinople friend.

"They rather resemble our white Polands, but with more furnishing, and shorter legs, which are vulture-hocked, and feathered to the toes.

"In general habits, they are brisk, and happy-tempered; but not kept in so easily as Cochin-Chinas. They are very good layers; their eggs are large and white: they are non-sitters, and small eaters. A grass run with them will remain green long after the crop would have been cleared by either Brahmas or Cochins; and, with scattered food, they soon become satisfied, and walk away."

SULTANS.

FEEDING AND FATTENING.

A year or so ago, that sound-headed, matter-of-fact lady, Miss Harriet Martineau, presented to the world, through the medium of a popular journal, her experiences of farming on two acres. The poultry-yard comes in for a considerable share of the lady-farmer's attention, and, as the remarks thereto pertaining are of the most valuable kind, we make no scruple of selecting a few of them for the edification and instruction of our readers:—

"It becomes," she truthfully says, "an interesting wonder every year why the rural cottagers of the United Kingdom do not rear fowls almost universally, seeing how little the cost would be and how great the demand. We import many millions of eggs annually. Why should we import any? After passing dozens of cottages on commons or in lanes in England where the children have nothing to do, and would be glad of pets, you meet a man with gold rings in his ears, who asks you in broken English to buy eggs from the Continent. Wherever there is a cottage family living on potatoes or better fare, and grass growing anywhere near them, it would be worth while to nail up a little pent-house, and make nests of clean straw, and go in for a speculation in eggs and chickens. Seeds, worms, and insects go a great way in feeding poultry in such places; and then there are the small and refuse potatoes from the heap, and the outside cabbage-leaves, and the scraps of all sorts. Very small purchases of broken rice (which is extremely cheap), inferior grain, and mixed meal would do all else that is necessary. There would be probably larger losses from 'vermin' than in better guarded places; but these could be well afforded as a mere deduction from considerable gains. It is understood that the keeping of poultry is largely on the increase in the country generally, and even among cottagers; but the prevailing idea is of competition as to races and specimens for the poultry-yard, rather than of meeting the demand for eggs and fowls for the table."

The chicks most likely to fatten well are those first hatched in the brood, and those with the shortest legs. Long-legged fowls, as a rule, are by far the most difficult to fatten. The most delicate sort are those which are put up to fatten as soon as the hen forsakes them; for, as says an old writer, "then they will be in fine condition, and full of flesh, which flesh is afterwards expended in the exercise of foraging for food, and in

the increase of stature; and it may be a work of some weeks to recover it,—especially with young cocks."

But whether you take them in hand as chicks, or not till they are older, the three prime rules to be observed are, sound and various food, warmth, and cleanliness. There is nothing that a fatting fowl grows so fastidious about as his water. If water any way foul be offered him, he will not drink it, but sulk with his food, and pine, and you all the while wondering the reason why. Keep them separate, allowing to each bird as much space as you can spare; spread the ground with sharp, sandy gravel; and take care that they are not disturbed. In addition to their regular diet of good corn, make them a cake of ground oats or beans, brown sugar, milk, and mutton suet. Let the cake lie till it is stale, then crumble it, and give each bird a gill-measureful morning and evening. No entire grain should be given to fowls during the time they are fattening; indeed, the secret of success lies in supplying them with the most nutritious food without stint, and in such a form that their digestive mills shall find no difficulty in grinding it.

It would, I think, be a difficult matter to find, among the entire fraternity of fowl-keepers, a dozen whose mode of fattening "stock" is the same. Some say that the grand secret is to give them abundance of saccharine food; others say nothing beats heavy corn steeped in milk; while another breeder, celebrated in his day, and the recipient of a gold medal from a learned society, says, "The best method is as follows:—The chickens are to be taken from the hen the night after they are hatched, and fed with eggs hardboiled, chopped, and mixed with crumbs of bread, as larks and other small birds are fed, for the first fortnight; after which give them oatmeal and treacle mixed so as to crumble, of which the chickens are very fond, and thrive so fast that, at the end of two months, they will be as large as full-grown fowls."

Others there are who insist that nothing beats oleaginous diet, and cram their birds with ground oats and suet. But, whatever the course of diet favoured, on one point they seem agreed; and that is, that, while fattening, the fowls *should be kept in the dark.* Supposing the reader to be a dealer,—a breeder of gross chicken-meat for the market (against which supposition the chances are ten thousand to one), and beset with as few scruples as generally trouble the huckster, the advice is valuable. "Laugh and grow fat" is a good maxim enough; but "Sleep and grow fat" is, as is well known to

folks of porcine attributes, a better and more easy of accomplishment. The poor birds, immured in their dark dungeons, ignorant that there is light and sunshine abroad, tuck their heads under their wings and make a long night of it; while their digestive organs, having no harder work than to pile up fat, have an easy time enough. But, unless we are mistaken, he who breeds poultry for his own eating, bargains for a more substantial reward than the questionable pleasure of burying his carving-knife in chicken-grease. Tender, delicate, and nutritious *flesh* is the great aim; and these qualities, I can affirm without fear of contradiction, were never attained by a dungeon-fatted chicken; perpetual gloom and darkness is as incompatible with chicken-life as it is with human. If you wish to be convinced of the absurdity of endeavouring to thwart Nature's laws, plant a tuft of grass, or a cabbage-plant, in the darkest corner of your coal-cellar. The plant or the tuft may increase in length and breadth, but its colour will be as wan and pale, almost, as would be your own face under the circumstances.

The barn-door fowl is in itself a complete refutation of the cramming and dungeon policy of feeding practised by some. This fowl, which has the common run of the farm-yard, living on dairy-scraps and offal from the stable, begins to grow fat at threshing-time. He has his fill of the finest corn: he has his fill of fresh air and natural exercise; and at last he comes smoking to the table,—a dish for the gods.

In the matter of unnaturally stuffing and confining fowls, Mowbray is exactly of our opinion. He says: "The London chicken-butchers, as they are termed, *i. e.*, poulterers, are said to be, of all others, the most expeditious and dextrous feeders, putting up a coop of fowls, and making them thoroughly fat within the space of a fortnight; using much grease, and that perhaps not of the most delicate kind, in the food. In this way I have no boasts to make, having always found it necessary to allow a considerable number of weeks for the purpose of making fowls fat in coops. In the common way this business is often badly managed, fowls being huddled together in a small coop, tearing each other to pieces, instead of enjoying that repose which alone can insure the wished-for object; irregularly fed and cleaned, until they become so stenched and poisoned in their own excrement, that their flesh actually smells and tastes of it when smoking upon the table."

Sussex produces the fattest and largest poultry of any county

in England, and the fatting process there most common is to give them a gruel made of pot liquor and bruised oats, with which are mixed hog's grease, sugar, and milk. The fowls are kept very warm, and crammed morning and night. They are put into the coop, and kept there two or three days before the cramming begins, and then it is continued for a fortnight, and the birds are sent to market.

The lady poultry-breeder before-mentioned summarizes, in an admirable manner, the way in which fowls should be kept by those who are not stinted for space, and who are desirous of deriving profit as well as pleasure from their "fancy," as the vulgar phrase is.

"The most expensive of all food we find to be barley, *au naturel*. Not only is a considerable proportion thrown about and wasted, but much that is swallowed is never digested. We, therefore, give it as a change and an indulgence; and by no means as the staple of their food. Indian meal is the best staple, according to our experience. It is well scalded, that the swelling may be done before eating, instead of after, thus avoiding various maladies and perils from over-eating. Broken rice, well boiled, is good to a certain extent. Malt-dust is a valuable resource. The demand is becoming so great, that probably it will soon cease to be a cheap food; but while it remains so it is a real boon both to the fowls and their owners. They will eat almost anything that is sprinkled with malt-dust; and a 6s. sack of it goes a long way. A certain proportion of green food, and also of animal food, is indispensable. Lettuce-leaves, turnip-tops, cabbage-leaves, celery, should be thrown to them. They should have access to grass, to pick seeds and insects; and it is well to put a fresh sod into the poultry-yard whenever such a valuable thing may be spared. All the worms and insects that come in the gardener's way should be presented to them; and when insects are scarce, scraps of raw meat, minced as fine as pin's heads, should be given. Add finely-chopped eggs for infant chicks, and I think the bill of fare is complete. As for the pepper-corn which old wives recommend as the first thing to be swallowed, we reprobate the notion as we should in the case of any other new-born creature. In fact, it irritates the crop very mischievously if it gives out its savour, and if it does not dissolve it is nothing."

In a strictly business point of view, the results of this management were not particularly brilliant; yet we have not the least doubt that the majority of poultry keepers—into

whose calculations, by-the-by, the question of money gain does not enter very considerably—would be well pleased to have their endeavours so kindly seconded by Dame Fortune. However, we will lay the lady's "statement of accounts" before the reader, assuring him beforehand that he need not fear the least shadow of exaggeration, and let him judge for himself.

"In 1857, we paid for food £17 1s. 8d., and for improvements in the hen-house £1 15s.—that is, our expenses were £18 16s. 8d.; eggs and fowls used and sold were worth £18 4s. 2d., ten chickens and one young cock in stock, £1 5s., making £19 9s. 2d.; which shows our profits to have been 12s. 6d. In 1858, the cost of food was £16 8s. 2d., and improvements in stock 11s. 9d., together making £16 9s. 11d.; our profits, therefore, being 10s. 7d. London prices would have enriched us mightily, for we had 3,039 eggs, and killed sixty-three fowls (including a few ducks). Within a dozen miles of the General Post-office, our produce would have been worth £30. But it must be remembered that, in regard to our domestic consumption, we have the benefit of the country prices. As it is, we have a balance on the right side, instead of on the wrong, after all accidents and misfortunes are accounted for."

"Aye, aye," the desponding reader may exclaim, "it's all very well for folks who have luck." We can, however, assure him for his consolation, that Miss Martineau did not have a superabundance of good fortune with her "feathered friends." The cocks ate the ivy leaves, and were found dead and cold; ducklings lost themselves in the tall grass and perished miserably; chicks committed suicide by drowning in shallow water-pans; a hawk haunted the neighbourhood and grew fat on the callow broods; and as to cats—as many as eight chickens were snatched off in a single day by freebooting grimalkins. Indeed, so formidable became this last-mentioned grievance, that the good lady was driven to invent a means of conquering the marauders. As it may be useful to our readers we publish it. "When a cat is seen to catch a chicken, tie it round her neck and make her wear it for two or three days; fasten it securely, for she will make incredible efforts to get rid of it. Be firm for that time and the cat is cured." It is probable that the celebrated Mrs. Glasse's axioms may occur to the reader—"First *catch* your cat!" With her heart hardened by long persecution, however, Miss Martineau is equal to this difficulty. "Wild, homeless, hungry, ragged, savage cats," says she, "are more difficult to catch; but they are outlaws,

and may be *shut*, with the certainty that all neighbours will be thankful."

Not only for the sake of telling a good story, but further to impress on the reader's mind that our lady poultry-keeper had not quite "all the luck to herself," and furthermore to illustrate the advantage of prompt action in sudden difficulties, we will relate, in Miss Martineau's own language, a most memorable "night with the chickens," endured by herself and her friend M.——.

"My entire poultry-yard, except a few old hens on the perches, was in danger of destruction by an accident one summer night, and was saved by what I cannot but consider a remarkable exercise of energy on the part of my companion M——. Few persons in the north of England will ever forget the thunder-storm on the night of the 24th of July, 1859. At eleven p.m. the rain came down in one sheet, instantly flooding the level ground to the depth of more than a foot, and the continuous thunder seemed to crack on one's very skull, while the blue lightning never intermitted for two seconds for above an hour. The heat was almost intolerable. Our maids, however, who kept very early hours, were sleeping through it all; when M—— escorted me (very feeble through illness) upstairs, settled me with my book in my easy chair, and bade me good night.

"Presently I drew up a window-blind to see the lightning better from my seat. In the midst of its blue blazes there was more than once a yellow flicker on the window-frame which I could not understand. I went to look out and saw a yellow light whisking about far below, sometimes in the quarry, and then mounting or descending the terrace steps. It was M—— saving the fowls. She would not allow the maids, who were striving enough now, to go straight from their beds into the storm; and she knew it was useless to call the man from the cottage, who was a mere incumbrance on critical occasions. In fact, he and his wife were at that moment entirely persuaded that the end of the world was come. It was no form of speech, but their real conviction; and it could not have been asked of them to care about ducks and chickens. The maids were lighting a fire in the back kitchen, and strewing the floor with straw, while M—— was out in dress that could not be spoiled, lantern, basket and apron. Some of the hens and chickens were too cramped to move, sitting in the water. Some were taking refuge in the shrubs. Two duck-

lings were dead, and two more died afterwards. M—— went again and again, and to both the poultry-yards, and brought up forty fowls—all that were in danger—every one of which would have been dead before morning. Of course she had not a dry thread about her, nor a dry hair on her head; but the wetting was a trifle in comparison with the bewildering effects of the thunder and lightning in such a midnight. She did not, however, suffer from it more nor less, and our poultry-yard was saved."

CONCERNING EGGS AND CHICKS.

Eggs intended for hatching should be removed as soon as laid, and placed in bran in a dry, cool place. Choose those that are near of a size; and, as a rule, avoid those that are equally thick at both ends,—such, probably, contain a double yolk, and will come to no good. Eggs intended for hatching should never be stored longer than a month, as much less the better. Nine eggs may be placed under a Bantam hen, and as many as fifteen under a Dorking. The odd number is considered preferable, as more easily packed. It will be as well to mark the eggs you give the hen to sit on, so that you may know if she lays any more: if she does, you must remove them; for, if hatched at all, they would be too late for the brood. If during incubation an egg should be broken, remove it, and take out the remainder, and cleanse them in luke-warm water, or it is probable the sticky nature of the contents of the broken egg will make the others cling to the hen's feathers; and they, too, may be fractured.

Some hens are very capricious as regards sitting; they will make a great fuss, and keep pining for the nest, and when they are permitted to take to it, they will sit just long enough to addle the eggs, and then they are off again. The safest way to guard against such annoyance, is to supply the hen with some hard boiled eggs; if she sits on them a reasonable time, and seems steadily inclined, like a good matron, you may then give her proper eggs, and let her set about the business in earnest.

Sometimes the chick within the shell is unable to break away from its prison; for the white of the egg will occasionally harden in the air to the consistence of joiners' glue, when the poor chick is in a terrible fix. An able writer says: "Assistance in hatching must not be rendered prematurely, and thence unnecessarily, but only in the case of the chick being plainly unable

to release itself; then, indeed, an addition may probably be made to the brood, as great numbers are always lost in this way. The chick makes a circular fracture at the big end of the egg, and a section of about one-third of the length of the shell being separated, delivers the prisoner, provided there is no obstruction from adhesion of the body to the membrane which lines the shell. Between the body of the chick and the membrane of the shell there exists a viscous fluid, the white of the egg thickened with the intense heat of incubation, until it becomes a positive glue. When this happens, the feathers stick fast to the shell, and the chicks remain confined, and must perish if not released."

The method of assistance to be rendered to chicks which have a difficulty in releasing themselves from the shell, is to take the egg in the hand, and dipping the finger or a piece of linen rag in warm water, to apply it to the fastened parts until they are loosened by the gluey substance becoming dissolved and separated from the feathers. The chick then being returned to the nest, will extricate itself,—a mode generally to be observed, since, if violence were used, it would prove fatal. Nevertheless, breaking the shell may sometimes be necessary; and separating with the fingers, as gently as may be, the membrane from the feathers, which are still to be moistened as mentioned above, to facilitate the operation. The points of small scissors may be useful, and when there is much resistance, as also apparent pain to the bird, the process must be conducted in the gentlest manner, and the shell separated into a number of small pieces. The signs of a need of assistance are the egg being partly pecked and chipped, and the chick discontinuing its efforts for five or six hours. Weakness from cold may disable the chicken from commencing the operation of pecking the shell, which must then be artificially performed with a circular fracture, such as is made by the bird itself.

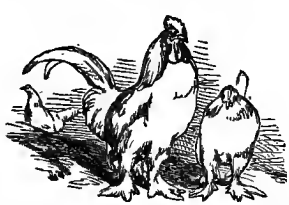
The chicks that are first hatched must be taken from the hen, or she may think her task at an end, and leave the remaining eggs to spoil. As soon as the young birds are taken from the mother, they must be placed in a basket lined with soft wool or hay, and stood in the sun in the summer, or by the fire if the weather be cold. It is a common pactice to cram young chicks with food as soon as they are born. This is quite unnecessary; they will, so long as they be kept warm, come to no harm if they take no food during the twenty-four hours following their birth. Should any of the brood remain

unhatched after that time, those that are born may be fed with bread soaked in milk, and the yolk of hard-boiled egg.

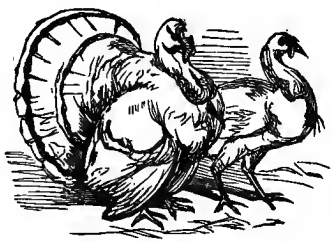
When the whole brood is hatched it should be placed along with the mother, under a coop, in a warm, dry spot. If you happen to have two hens at brood at the same time, be sure and keep the respective chicks separate, as if they get mixed the hens will probably maim or destroy those that do not belong to them.

After being kept snug beneath the coop for a week, the chicks may be turned loose for an hour or so in the warmest part of the day. They must be gradually weaned from the soaked bread and chopped egg, and boiled barley or groats given instead, and in eight or ten days their stomachs will be strong enough to receive bruised barley, and at the end of three weeks, if your chicks be healthy, they will be able to take care of themselves. It will be well, however, to keep your eye on them a week or so longer as the elder chicks may drive them from their food.

Great care should be taken that the very young chicks be prevented from running about the wet ground, or on damp grass. Recollect that this is the most prominent and fatal cause of disease. I should have mentioned, that while under the coop with their mother, they should be provided with a shallow pan or plate of water, as they are very liable to drench themselves and to take cold, if provided with no other drinking vessel than the one proper for the parent bird.



FEATHER-LEGGED BANTAMS.



THE TURKEY.

Roast turkey is one among the many good things for which the world has to thank Columbus; for, prior to the discovery of America, it was a "dainty dish" that had never been set before even the king. Cynics and misanthropes may curve their profound noses at a man who could waste a word about so trifling an affair; but for that I don't care. To discard turkey, is to knock away one of the prime buttresses of Christmas, and to do damage to that venerated institution is, as every Englishman is prepared to vouch, ultra-paganish, and deserving of the stocks at the very least. Trifling, indeed! To pacify ten thousand hungry bellies, to make twenty thousand eyes twinkle again, is a worthy achievement. Were I a descendant of Columbus, I would insist on adding a turkey to my armorial bearings.

The wild American fellow was, however, of more gigantic stature than is *meleagius domesticus*—the domestic turkey. The former bird measured five feet from his beak to his tail's tip; when he spread his wings they covered full six feet of ground. In a "Perfect Description of Virginia," a quaint volume, printed by hands that two hundred years ago had gone to dust, we are told the colonists of the new world had "wilde turkies, some weighing sixtie pound weight." Even at the present day, they abound in great flocks in the vicinity of the Ohio and Mississippi, though they either have dwindled in

size, or else the compiler of the "Perfect Description" told dreadful stories, for all modern travellers agree that the "wilde turkie" is never found to exceed thirty-five pounds in weight

Speaking of the habits of the wild turkey, a reliable writer says, "The males associate in parties of from ten to a hundred, and seek their food apart from the females, which either go about singly with their young, at that time about two-thirds grown, or form troops with other females and their families, sometimes to the amount of seventy or eighty. These all avoid the old males, who attack and destroy the young whenever they can by reiterated blows on the skull.

"But all parties travel in the same direction, and on foot, unless the hunter's dog, or a river on their line of march, compels them to take wing. When about to cross a river, they select the highest eminences, that their flight may be more sure, and in such positions they sometimes stay for a day or more, as if in consultation. The males on such occasions gobble obstreperously, strutting with extraordinary importance, as if to animate their companions; and the females and young assume much of the pompous air of the males, and spread their tails as they move silently around.

"At length, having mounted to the top of the highest trees, the assembled multitude, at the signal-note of their leader, wing their way to the opposite shore. The old and fat birds, contrary to what might be expected, cross without difficulty even when the river is a mile in width; but the wings of the young and meagre, and of course those who are weak, frequently fail them before they have completed their passage, when in they drop and are forced to swim for their lives. This they do cleverly enough, spreading their tails for support, closing their wings, stretching out their necks, and striking out quickly and strongly with their feet. All however do not succeed in such attempts, and the weaker often perish."

Mr. Jesse relates, on what he considers good authority, that in the reign of George the Second a flock of wild turkeys, three thousand strong, formed part of the live stock of Richmond Park. The worthy naturalist tells us that in the autumn and winter they fed on acorns, of which they must have had a considerable supply, since the park was then almost entirely wooded with oak, with a thick cover of furze; and that stacks of barley were put up in different places in the park for their support. Considering this liberal arrangement, we are not much surprised to hear that some of the old cock birds

attained an enormous weight, as much, indeed, as thirty pounds. These wild turkeys of Richmond, says Mr. Jesse, "were hunted with dogs, and made to take refuge in the trees, where they were frequently shot by George the Second. I have not been able to learn how long they had been there preserved before his reign, but they were totally destroyed towards the latter end of it, in consequence of the dangers to which the keepers were exposed in protecting them from poachers, with whom they had many bloody fights, being frequently overpowered by them."

Besides the American turkey (from which the bird of modern Leadenhall directly descends), there are two smaller sorts,—one peculiar to Honduras, and the other (the Brush Turkey) to New South Wales. One of the most remarkable circumstances connected with the economy of the latter bird is that, instead of hatching its own eggs, it constructs an artificial incubator. Having laid fifteen or twenty eggs, it collects a quantity of decaying vegetable matter, and piles it over them, trusting to the heat engendered during decomposition for the production of its progeny. According to Gould, the naturalist, "the heap employed for this purpose is collected by the birds during several weeks previous to the period of laying; it varies in size from two to four cartloads, and is of a perfectly pyramidal form. The construction of the work is not the task of one pair of birds, but is effected by the united labours of several. The same site appears to me, from the great size and the entire decomposition of the lower part, to be resorted to for several years in succession, the birds adding a fresh supply of materials previous to laying.

"The mode in which the material composing these mounds is accumulated is equally singular, the bird never using the beak, but always grasping a quantity in its foot, throwing it backwards to one common centre, and thus clearing the surface of the ground for a considerable distance so completely, that scarcely a leaf or a blade of grass is left.

"The heap being accumulated, and time allowed for sufficient heat to be engendered, the eggs are deposited, not side by side, as is ordinarily the case, but planted at the distance of nine or twelve inches from each other, and buried at nearly an arm's depth, perfectly upright, and with the large end upward. They are covered up as they are laid, and allowed to remain till they are hatched."

The same indefatigable explorer was informed by the native inhabitants that it was customary with the hen turkeys to

lurk about in the neighbourhood of the egg-heaps, with the view of assisting the chicks out of the shells as soon as they evince an inclination to break cover. Mr. Gould, however, discredits this, grounding his disbelief on the fact that he on one occasion, while turning out one of those egg-stores, discovered the remains of a young bird, evidently recently from the shell. With all due deference to so great an authority, I submit that this evidence is not absolutely conclusive. The mother of the precocious chick might not have known that it was out; and the fact of its being found dead rather favours the supposition that the assistance of a friendly beak is necessary to release them from their imprisonment.

We will now consider the turkey in its domestic aspect. Before, however, I say a word as to its feeding and breeding, I would impress on my readers that unless they have an ample piece of land attached to their dwelling, they had best not set up as turkey breeders. It is bad enough for fowls to be cribbed up in cockney "yards" and wash-houses, but to treat turkeys so is worse than useless, inasmuch as it is cruel. The turkey hen must have room to stretch her long legs. Beware, however, of letting her out of your sight, especially when she has a little family. She is partial to taking long walks, and on she will go, mile after mile, with the greatest complacency, never once turning her head to see how her panting chicks are getting on,—not the least affected even when they squat down on the road and implore her plaintively to come back; not she; on she goes, over common and highway and meadow, as long as a single chick has strength to follow her.

This, however, arises from sheer heedlessness, and not from want of affection. She will fight for her brood as valiantly as will the pheasant for hers. She, moreover, preserves her instinctive dread of birds of prey in a remarkable way. A friend of mine tells me that on one occasion the turkey-hens in his yard exhibited great fright, screaming, and calling their chicks to them frantically. On looking about for the cause, he discovered it in a boy's kite that was floating high over head.

Writing on the same subject, a French naturalist says, "I have heard a turkey-hen, when at the head of her brood, send forth the most hideous screams, without my being able to perceive the cause; her young ones, however, immediately when the warning was given, skulked under the bushes, the grass, or whatever else seemed to offer shelter and protection. They even stretched themselves, at full-length, upon the ground,

and continued motionless, as if dead. In the mean time, the mother with her eyes directed upwards, continued her cries and screaming as before. On looking up in the direction in which she seemed to gaze, I discovered a black spot, just under the clouds, but was unable at first to distinguish what it was; however, it soon proved to be a bird of prey, though at first at too great a distance to be distinguished. I have seen one of these birds continue in this agitated state, and her whole brood pinned down, as it were, to the ground, for hours together, whilst their formidable foe has taken his circuits and mounted and hovered directly over their heads. At last, on his disappearing the parent changed her note and sent forth another cry, which in an instant gave life to the whole trembling tribe, and they all flocked round her with expressions of pleasure as if conscious of their happy escape from danger."

If you have an obliging neighbour, owning a cock-turkey, and living within a reasonable distance, keep nothing but hens, for it very frequently happens that his lordship will quite lose his patience at the length of time his spouse occupies for incubation, and will endeavour to eject her from the nest by main force, and the consequence is that the eggs get broken.

According to her size, the turkey-hen will cover from nine to fifteen eggs, and while she is sitting it will be necessary to see that she is well provided with food and water, as, rather than quit her precious charge for a moment, she will almost starve.

As soon as the chicks are hatched, they must be taken from the nest and placed in a box, snugly lined with wool or flannel. An old and very general practice, is to plunge them into cold water, on the day of their birth, and to give each a peppercorn, in a little warm milk. The reason assigned for serving them so is, that of all young birds, they are most likely to take cold, and that this early cold-bath and peppering tends to harden their constitutions; "and, despite even this precaution," says an old writer, "the young turkey chicks who perish annually may be reckoned by thousands." It seems to me, however, to be a question whether the mortality would not be lessened were the "precaution" avoided. I know that farmers' wives, to a woman, will look on this suggestion as rank heresy; but I cannot banish from my mind the various tortures poultry are made to endure at the hands of these well-meaning but superstitious dames. For example, there are poultry wives who insist that the proper way to cure a hen of

sitting is to plunge her in cold water; others, to force her to sit, "thrust a feather through her nostrils, give her half a glass of gin, then swing her round until seemingly dead, and confine her in a pot, during a day or two, leaving her only a small breathing hole."

The hen and her brood must be kept under cover for a month if the weather be very fine, but do not hurry them out at an inclement season of the year. The first food should be barley-meal, kneaded into dough with milk, and eggs boiled hard and chopped. When they are two or three weeks old, boiled beef or mutton, *pulled* to shreds, may be cast about their feeding ground. A fresh turf daily (be sure it is free from snails and slugs) will be gratefully acknowledged.

If the turkey chick should evince symptoms of weakness, or if he should take cold, the best medicine is pounded carraway-seeds. The third day from its birth is reckoned a perilous time for the young turkey, as is the period when they throw out what is called the red-head, which happens when they are six or eight weeks old. At this latter period a few old split beans may, with advantage, be mixed with their food.

THE WILD DUCK.

THE DUCK.

THE duck in its wild state is found throughout Europe, Asia, and America. He is a magnificent fellow, and it is as hard to understand how the symmetry of his shape should have so entirely departed, and his gay coat—green and violet and orange and brown—should have faded to such draggle-tail dinginess as distinguishes the domestic duck of the modern poultry market, as it is to believe that the lithe, long-limbed wild ass of the desert and the donkey belonging to Welter the sweep are of the same family.

There are several ingenious modes of capturing the wild duck, peculiar to different parts of the world in which it is found; but the most ingenious is that of the Indians who dwell on the great lake of Maracaibo, on the north coast of South America.

A number of calabashes, prepared from the rind of some fruit, and resembling an empty gourd, are always kept floating up and down the lake, on which swarm innumerable quantities of wild ducks. From habit, the ducks take no notice of the calabashes, but allow them to drift in and among their flocks without causing any stir. The Indian then prepares a calabash, in which he cuts holes for seeing and breathing, and places it over his head; with this, and a kind of belt round his waist, he starts on his duck-catching expedition. He is almost as used to the water as the birds he is in quest of, and easily steals quietly down towards the flock; and when within

an arm's length of a duck, catches it by the leg, and before it has time to utter a solitary "quack," he whips it under the surface and hangs it to his belt. And in this way, before a half-hour, our duck-catcher has a full belt, and returns to his companions. On another part of the coast there is a similar expedient practised, only that the head-piece, instead of being a calabash, is a kind of cap, made of rushes, which answers the same purpose, a number of them being kept continually floating up and down the water: this completely eludes the vigilance of the water-fowl, and they are as easily captured as with the above-mentioned trap. The same practice of snaring ducks prevails in China.

On the American rivers the modes of capture are various. Sometimes half a dozen artificial birds are fastened to a little raft, which is so weighted that the sham birds squat naturally on the water. This is quite sufficient to attract the attention of the passing flock who descend to cultivate the acquaintance of the isolated few, when the concealed hunter with his fowling-piece scatters a deadly leaden shower amongst them. In the winter, when the water is covered with rubble ice, the fowler of the Delaware paints his canoe entirely white, lies flat in the bottom of it, and floats with the broken ice, from which the aquatic inhabitants fail to distinguish it; so floats the canoe till he within it understands by the quacking and flutter, and whirring of wings, that he is in the midst of a flock, when he is up in a moment with the murderous piece, and dying quacks and lamentations rend the still air.

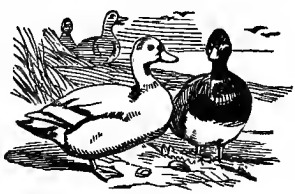
The following account of how duck-snaring used to be managed in the fens of Lincolnshire will be found interesting:—

"In the lakes to which they resorted, their favourite haunts were observed, and in the most sequestered part of a haunt a pipe or ditch was cut across the entrance, decreasing gradually in width from the entrance to the further end, which was not more than two feet wide. The ditch was of a circular form, but did not bend much for the first ten yards. The banks of the lake, on each side of the ditch, were kept clear from reeds and close herbage, in order that the ducks might get on them to sit and dress themselves. Along the ditch poles were driven into the ground, close to the edge, on each side, and the tops were bent over across the ditch and tied together.

"The poles then bent forward at the entrance of the ditch and formed an arch, the top of which was ten feet distant from the surface of the water; the arch was made to decrease

in height as the ditch decreased in width, so that the remote end was not more than eighteen inches in height. The poles were placed about six feet from each other, and connected by poles laid lengthwise across the arch and tied together. Over the whole was thrown a net which was made fast to a reed fence at the entrance, and nine or ten yards up the ditch, and afterwards strongly pegged to the ground.

"At the end of the ditch furthest from the entrance, was fixed what was called a 'tunnel-net,' of about four yards in length, of a round form, and kept open by a number of hoops, about eighteen inches in diameter, placed at a small distance from each other to keep it distended. Supposing the circular bend of the ditch to be to the right, when one stands with his back to the lake, then on the left hand side, a number of reed fences were constructed, called 'shootings,' for the purpose of screening the decoy man from observation, and in such a manner that the fowl in the decoy might not be alarmed, while he was driving those that were in the pipe. These shootings, which were ten in number, were about four yards in length, and about six feet high. From the end of the last shooting, a person could not see the lake, owing to the bend of the ditch, and there was then no further occasion for shelter. Were it not for these shootings, the fowls that remained about the mouth of the ditch would have been alarmed if the person driving the fowls, already under the net, should have been exposed, and would have become so shy as entirely to forsake the place.



CALL DUCKS.

"The first thing the decoy man did, on approaching the ditch, was to take a piece of lighted turf or peat and to hold it near his mouth to prevent the birds from smelling him. He was attended by a dog trained to render him assistance. He walked very silently about half way up the shootings, where a small piece of wood was thrust through the reed-fence, which made an aperture just large enough to enable him to see if there were any fowls within; if not, he walked forward to see if any were about the entrance of the ditch. If there were he stopped, made a motion to his dog, and gave him a piece of cheese to eat; when the dog went directly to a hole in the reed-fence, and the birds immediately flew off the bank into

the water. The dog returned along the bank, between the reed-fences, and came out to his master at another hole. The man then gave the dog something more to encourage him, and the dog repeated his rounds, till the birds were attracted by his motions, and followed him into the mouth of the ditch;—an operation which was called 'working them.'

"The man now retreated further back, working the dog at different holes, until the ducks were sufficiently under the net. He then commanded his dog to lie down under the fence, and, going himself forward to the end of the ditch next the lake, he took off his hat, and gave it a wave between the shooting. All the birds that were under the net could then see him, but none that were in the lake could. The former flew forward, and the man then ran to the next shooting and waved his hat, and so on, driving them along until they came to the tunnel-net, into which they crept. When they were all in the man gave the net a twist so as to prevent them getting back. He then took the net off from the end of the ditch and taking out, one by one, the ducks that were in it, dislocated their necks."

Duck shooting is another sport, once a very common and lucrative employment, but of late years almost entirely gone out of fashion. Profitable as the business may have been, the life of a duck-shooter was anything but an enviable one. Only in the winter could it be carried on at all, and then either late at night or very early in the morning, on wet, marshy places, surrounded by the sea. The wild duck is remarkable for the fineness of its scent, in addition to being exceedingly wary and timid, so that the duck-shooter could only approach them to leeward, with a piece of burning turf in his hand. He was obliged to have a pair of huge wooden pattens or he would not be able to proceed a hundred yards without sinking up to his waist. Indeed, so altogether comfortless and tiresome was the sport, that, purely out of charity, many duck-shooters would even deny themselves the company of a dog on their expedition. To show how precarious this sport must have been, an eminent naturalist, some years ago, wrote the following:—

"On the Cheshire side of the mouth of the river Dee, runs a ridge of three small rocky islands, called Great Helbree, Little Helbree, and, at the southern extremity, at a somewhat greater distance, forming the termination of the ridge, the Little Eye. At low water, the passage between these rocks and the mainland is entirely dry. At this time, therefore, those who were inclined to take the chance of one single shot, for a second loading was

out of the question, bent their way to the Little Eye, and took possession of a sort of excavated hovel, where, under cover of a few rough stones piled together, they were prepared to remain till high water; when, if they were fortunate (but this was by no means to be calculated upon with anything like certainty), a floating flock of ducks and other sea-fowl would drift within reach, and a well-directed fire might do prodigious execution."

On the coast of Hampshire this sport is still in vogue. The duck-shooter conceals himself till nightfall, and waits anxiously till a flock has descended to feed. He then gets as near to them as possible, and fires into the midst, and if he has another gun snatches it up and fires again, and then hastens to the spot and gathers up the spoil.

One of the most remarkable stories of duck-shooting is related by Stanley, in his "History of Birds." "On one of these expeditions," says he, "a duck-shooter, in Hampshire, met with a perilous adventure. Mounted on his mud-pattens, he was traversing one of these oozy plains, and being intent only on his game, suddenly found the water rising with the tide. Aware of his danger, he looked round, but his retreat was already cut off; he was surrounded by the flowing sea, and death stared him in the face. But in this desperate situation his presence of mind remained, and an idea struck him which might yet be the means of his preservation. He gazed round to see if any part of the mud-desert was higher than the rest, and observing a small portion still a foot or two above the water, he hastened towards it, and when there, striking the barrel of his long gun deep into the ooze, he resolved to hold fast by it, as a prop to secure himself against the buffetings of the waves, which were breaking angrily around him, and had now reached his feet, and, at the same time, as an anchor, to which he might cling, and not be carried away by the current of the flowing or ebbing tide; or, at all events, that if it was to be his sad fate to perish, his body might be found by those friends who might venture out to search for him. Well acquainted with the usual rise of the tide, he had every reason to suppose that it would not reach above his middle, and that if he could endure the cold of six hours' immersion, he might be saved. Unfortunately, however, he had not taken into account the state of the wind, or some other causes, which had not only brought the waters up more rapidly than usual, but would also add to their height. Accordingly, having first felt the chill and deadly sensation of ripple after ripple, now

covering his feet, then bathing him knee-deep, and then advancing beyond his waist, he was horror-struck at finding that, instead of receding, it still crept upwards, and reached his shoulders; the spray burst over his head; upon another minute's rise or fall of tide his life depended; but still, though he gave himself up for lost, he firmly grasped his gun-barrel The mainland was too far distant to admit of his shouts being heard, and it was equally vain to hope that any looker-out could descry such a speck upon the waves as the head of a human being. In this awful moment of suspense, on looking downwards he thought he saw the *uppermost button of his waistcoat beginning to appear!* Intensely he watched it, but for some time without any well-founded assurance that he was right. At length, however, hopes increased to certainty—he saw button after button rising slowly into view—an infallible sign that the height of the tide was over, and that it was now upon the ebb. Though chilled with cold, and almost fainting, this welcome prospect raised his spirits, and acting like a cordial, enabled him to endure the remaining hours of his fearful imprisonment."

There is, however, another adventure related by the same authority, in which the party concerned were placed in the same terrible position, but all, unhappily, perished.

"Off the north-west point of the hundred of Wirral, in Cheshire, extends a wide tract of sand, forming a dangerous shoal, called Holyebank, which has proved the grave of many a shipwrecked mariner. To this bank, always dry at low water, the fishermen of the neighbourhood are in the frequent habit of going to collect mussels. One evening, a party having ventured as usual, before separating, agreed upon a particular point where they were to meet again when the tide began to come in. Dusk came on, and those who first returned to the boat rowed to the point of rendezvous, there to await the arrival of their comrades; but hour after hour passed, and some were yet missing. The boat-keepers began to fear the worst; the absentees had either lost their way on the wide desert of sand, and were now wandering about hopelessly in darkness, or they had perished in one of the many quicksands which abounded on the shoal. Still they hung upon the anchor, and waited till, at its appointed hour, the tide had covered the whole bank, and not a doubt could remain as to the fate of their friends. They then returned to reveal the sad tidings to their relatives on shore, and at early dawn repaired once more

to the bank, now dry as when they first landed. One body alone was found, and he, like the duck-shooter, had resorted to the same lost and forlorn hope. He had firmly fixed a boat-hook on the highest ridge of sand, and, having lashed himself to it with his handkerchief, had determined there to await the rising of the last tide he was ever destined to behold. The bodies of his companions were never seen again, and had probably found a resting-place in the deep channels of the surrounding sea."

In the poultry-yard, the duck is no mean tenant; and is fond of asserting its supremacy. Many are the skirmishes that take place for a supply of food betwixt it and the fowls, and even *Gallus domesticus*—stately and terrible as he is—is no match for the impudence and cunning of this homely species of the genus *Anas*. The Rev. J. G. Wood, in his own clear way, thus vividly portrays a battle of the ducks and fowls as witnessed by him:—

"In a farm-yard with which I was once intimately connected, there were several ducks who were shut up at night in a very spacious coop, but who were not at all satisfied with the provender given to them, but yearned for some of that given to the fowls. So impatient were they of their imprisonment that directly they saw any of their acquaintances in the farm-yard, they used to set up a most clamorous quacking, in hopes of being released. There were several grand battles between the ducks and the master-cock of the yard, which invariably terminated in the victory of the ducks. The mode of combat was as follows:—The poultry would be pecking up the grain thrown to them, when in would rush a duck, scooping up with its broad beak more at one sweep than the fowl would take in a dozen pecks. This behaviour naturally incenses the cock, who accordingly flies at the duck and pecks it. The duck crouches down and makes no resistance, but contrives to get behind the cock, and to give him a very hard peck, at the same time turning round and looking innocent. Round jumps the cock, intent upon vengeance, but seeing nothing to account for the blow that he has just received, he puts it down to the charge of a stray stone, or such other misfortune, and returns to his meal. No sooner has his attention been fixed upon his food, when he receives another hard peck, jumps round, and sees the duck looking innocent as before. This time, however, he suspects something, and, while he pecks at the barley, keeps a look out from the corner of his eye.

Soon comes another peck; but this time the duck is seen, and aggrieved chanticleer dashes at him with all the anger of three assaults combined. Down flops the duck on the ground, tucking his head under his wing; the cock runs over him in triumph, walking once or twice over his prostrate enemy, and returns to his meal in high spirits. Presently the duck draws out his head, opens first one eye, then the other, gets up cautiously, saunters behind the cock, and salutes him with another peck. The irritated bird again attacks his foe, again meets with no opposition, again returns to his food, and is again attacked in a similar manner, until he is completely wearied out, and finally takes to flight, pursued by the triumphant duck, who has won, like Fabius, by delay."

Several anecdotes are related of the attachment of the duck to its young, some of which are rather remarkable and interesting. Says a well-known naturalist:—"A farmer's wife had a young duck, which by some accident was deprived of its companions, and from that moment seemed to concentrate all its affections on her. Wherever she moved, it followed her so closely that she was in constant fear of treading upon and crushing it to death. As it grew older, its affections seemed to strengthen rather than diminish; it laid itself by the fire and basked on the hearth, and when noticed seemed delighted. This continued till some other ducks were procured, when, being constantly driven out of the house, it gradually associated itself with its more natural companions."

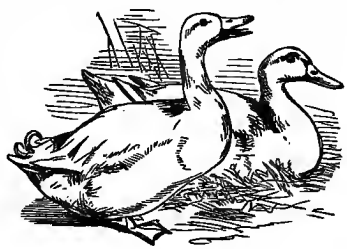
The same authority relates a singular instance of a fierce house-dog being greatly attached to a brood of ducks, "who, notwithstanding his apparently savage disposition, soon became so fond of him, that whenever, from his barking, they apprehended danger, they would rush towards him for protection, and seek shelter in his kennel."

Naturalists count nearly a hundred species of the duck genus, scattered over all parts of the world; and there is little doubt that the intending keeper of this profitable bird may take his choice from at least twenty different sorts. No great amount of knowledge neither is necessary in purchasing them, as there is very little difference in the whole family, either as regards hardiness, laying, or hatching, so that the most ignorant may indulge his fancy without being afraid of making a bad bargain.

The white Aylesbury duck is, and deservedly, a universal favourite. Its snowy plumage and comfortable comportment

make it a credit to the poultry-yard, while its broad and deep breast, and its ample back, convey the assurance that your satisfaction will not cease at its death. In parts of Buckinghamshire, this member of the duck family is bred on an extensive scale; not, however, as might be naturally imagined, on plains and commons, but in the abodes of the cottagers. Round the walls of the living-rooms, and of the bed-rooms even, are fixed rows of wooden boxes, lined with hay; and it is the business of the wife and children to nurse and comfort the feathered lodgers, to feed the little ducklings, and to take the old ones out for an airing. Sometimes the "stock" ducks are the cottager's own property, but it more frequently happens that they are intrusted to his care by a wholesale breeder, who pays him so much per score for all ducklings properly raised. To be perfect, the Aylesbury duck should be plump, pure white, with yellow feet, and a flesh-coloured beak.

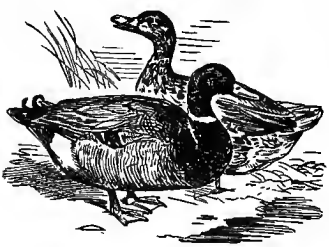
Every one knows how awkward are the *Anatidæ*, waddling along on their unelastic webbed toes, and their short legs, which, being placed considerably backward, make the fore part of the body preponderate. Some, however, are formed more adapted to terrestrial habits than others, and notably amongst these may be named *Dendronessa sponsa*, the summer duck of America. This beautiful bird rears her young in the holes of trees, generally overhanging the water. When strong enough, the young scramble to the mouth of the hole, launch into the air with their little wings and feet spread out, and drop into their favourite element. Whenever their birthplace is at some distance from the water, the mother carries them to it, one by one, in her bill, holding them so as not to injure their yet tender frame. On several occasions, however, when the hole was 30, 40, or more yards from a piece of water, Audubon observed that the mother suffered the young to fall on the grass and dried leaves beneath the tree, and afterwards led them directly to the nearest edge of the next pool or creek. There are some curious varieties of the domestic duck, which only appear interesting from their singularity, for there does not seem to be anything of use or



AYLESBURY DUCKS.

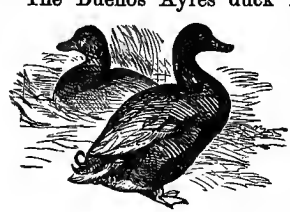
value in the unusual characteristics which distinguish them; thus, the bow-bill duck, as shown in the engraving, called by some writers the hook-bill, is remarkable for the peculiarly strange distortion of its beak, and the tuft on the top of its head. The penguin duck, again, waddles in an upright position, like the penguin, on account of the unnatural situation of its legs. These odd peculiarities add nothing of value to the various breeds, and would seem to be the result of accidental malformation, transmitted from generation to generation.

The Rouen, or Rhone duck, is a large and somewhat handsome variety, of French extraction. The plumage of the Rouen duck is somewhat sombre; its flesh is also much darker, and, though of higher flavour, not near so delicate as that of our own Aylesbury. It is with this latter breed that the Rouen duck is generally mated; and the result is said to be increase of size and strength. In Normandy and Brittany, these ducks, as well as other sorts, greatly abound; and the "duck-liver *pâtés*" are there almost as popular as the *pâté de foie gras* of Strasburg.



ROUEN DUCKS.

The Buenos Ayres duck is of East Indian birth, and is chiefly valuable as an ornament; for we suppose one would as soon think of picking a Chinese teal for luncheon, or a gold fish for breakfast, as to consign the handsome Buenos Ayres to the spit. The prevailing colour of this bird is black, with a metallic lustre, and a gleaming of blue steel about its breast and wings.



BUENOS AYRES DUCKS.

A valuable species of the duck family is the Eider-duck, which is found in the most dreary and desolate regions of the north. Iceland is a favourite resort of these birds during the breeding season; and here, owing to the little interruption on the part of the inhabitants, they are remarkably tame. "On approaching them," it is said, "the drakes, indeed, often take

alarm, and plunge with great precipitancy into the water; but the ducks generally remain sitting on their nests, or merely fly to the distance of a yard or two, and on an attempt to touch their eggs, return in a rage. Many of them suffer themselves to be handled, and can only be removed by actual force from their nests. In some parts of the island, where they are more particularly attended to, they build their nests on the roofs of the houses, and become quite familiar with the inhabitants."

The nest of the bird, which is carefully made of its own down, is plundered by the natives as soon as the duck has laid its first eggs, which are all taken. This is again repeated once or twice; but generally, if the nest is robbed more than two or three times, the birds leave the spot altogether. It must be a lucrative business for the Icelanders, for the merchants will give from twelve to fourteen shillings a pound for the down, and the eggs are the staple food of many a poor cottager. The down is remarkable for lightness and warmth; and is principally manufactured into coverings for beds. Thus, many of us lay on the feathers plucked from the back of a living bird; and are covered with the down that is robbed from the nest of another.

The way in which the eider-duck initiates her young brood in the art of swimming, is by carrying them out on her back and, suddenly diving, leaves them to their own resources, appearing again a little distance further on, and encouraging them to swim towards her.

Light-coloured ducks are always of milder flavour than their darker brethren; and those which are reared exclusively on vegetable diet will have whiter and more delicate flesh than those allowed to feast on animal offal. The flesh of birds fattened on animal food will be firmer than the other, and have a gamy flavour. The ancient notion that ducks whose beaks have a tendency to curve upward are better layers than another sort is simply absurd—all ducks are good layers if they are carefully fed and tended. Ducks generally lay in the night or early in the morning. While she is in perfect health she will do this; and one of the surest signs of indisposition among birds of this class is irregularity in laying.

The eggs laid will invariably nearly approach the colour of the layer,—light-coloured ducks laying white eggs, and brown ducks greenish-blue eggs. Dark-coloured ducks lay the largest eggs. One time of day the notion was prevalent that a duck would hatch no other eggs than her own; this is not true;

nevertheless it will be as well to match the duck's own eggs as nearly as possible, for I have known instances where the duck has turned out of the nest and destroyed eggs differing from her own in size and colour.

Concerning incubation a practical writer says :—"The duck requires a secret and safe place rather than any attendance, and will at Nature's call cover her eggs and seek her food. On hatching there is not often a necessity for taking away any of the brood; and, having hatched, let the duck retain her young ones upon the nest her own time. On her moving with her brood, prepare a coop upon the short grass if the weather be fine, or under shelter if otherwise, a wide and flat dish of water, often to be renewed, standing at hand; barley, or any other meal, should be the first food. In wet weather particularly, it is needful to clip the tails of the ducklings, or they will otherwise be apt to draggle and weaken the bird. Brood ducks should be cooped some distance from any other."

The period of her confinement to the coop depends on the weather and the strength of the ducklings. A fortnight seems the longest time necessary, and they may sometimes be permitted to enjoy the luxury of a swim at the end of a week. If, however, they be allowed to stay too long in the water at first they will be ill, their feathers will go rough, and they will have looseness of the bowels. If this should be the case, coop them close for a few days, and mix bean-meal or oatmeal with their ordinary food. Many duck-keepers give their birds nothing in the shape of food, letting them wander about and pick up a living for themselves. They will even seem to grow fat with this precarious feeding, but unless, besides this chance food, you take care morning and evening to supply them with a liberal feed of solid corn, their flesh will be flabby and insipid.

The simple way to fatten ducks is to let them have as much substantial food as they will eat. They will require no cramming, as does the turkey and some other poultry,—they will cram themselves to the verge of suffocation; they should, at the same time, be allowed plenty of exercise and clean water. Bruised oats and pea-meal is the standard fattening food for ducks.

EMDEN GEESE.

GEESE.

THE common goose has long been one of our most useful domestic animals; so long, indeed, that history is altogether silent on the subject, and fails to record the date when it first became a companion of man in this country. Julius Cæsar found the goose as well as the Briton when he visited us; and there is an old legend which relates that one of the former gave him more disquiet than all the hosts of his enemies. One night, while the Romans were encamped in great numbers, and the general was alone in his tent, reading some secret document, which, if perused by any other eye, might have cost him his head, he was suddenly startled by some one at his elbow, and, turning round in the utmost dismay, found a goose gravely conning the traitorous document.

Amongst the ancients, the goose was reckoned a sacred bird, and dedicated to that interesting mythological personage, Queen Juno. Pliny makes mention of the goose, and relates an instance of its affection, which is very interesting. A philosopher, named Lacydes, possessed one of these birds, which was remarkably attached to him; and when at study, in his own house, the faithful creature was always at his side. If he ventured abroad, to the public disputations or elocutions, the goose followed him, remained near him while delivering his orations, or paying his addresses to his fellow-citizens, and then returned home with him. At last the goose died, much to the sorrow of the unhappy philosopher, who, imagining that this extraordinary devotedness was connected with religious

feeling, conceived that his defunct friend was worthy of Christian sepulture, and accordingly caused it to be interred in a magnificent manner.

I do not wish to depreciate the bird's excellent qualities, and can seriously refer for the hundredth time to the oft-told story of the goose and the Roman capitol,—of the shrewd bird who wanted to save an egg, and did the same service towards a city. At the same time, it is in connection with a greater event than even that, owing to the important part it plays in a famous Christian festival, that we all ought, I think, to reverence the goose. The former story is but traditional, and, true or false, of little importance to us at the present time; the latter affords an annual proof of the goose being a public benefactor, and so deserving of acknowledgment.

In the time of the crusades, a goose was engraven on the banner at the head of one of the bands proceeding to Palestine to deliver the Holy Land from the dominion of the Saracens. It has been wickedly insinuated that the said banner was emblematical of many of the performances of the crusaders; certainly, it brings to one's mind the story of the fanatic who always walked to church on his hands, instead of his feet. Men's minds were much puzzled in endeavouring to account for so curious a mode of locomotion. One day, a bystander, who witnessed the pious gymnast performing this feat, mildly suggested as a reason for such extraordinary conduct, that "perhaps he liked the sensation;" and probably he was very nigh the truth.

The goose family is extensive. There is the Canada goose (the largest, and, according to many eminent naturalists, the most sagacious of the tribe), the Snow goose of Russia, the Laughing goose of North America (the Indians, who hunt this jocular creature, imitate its cry, or laugh, by ejaculating the syllable *wah*, at the same time slapping the mouth sharply), the common wild goose of Britain, the Bean goose, and the "Bernicle," or "Barnacle" goose. Concerning this last-mentioned animal a curious belief was once prevalent. "There is," says Gerard (who lived in the reign of Queen Elizabeth), "a small island in Lancashire called the Pile of Foulders (on the west side of the entrance into Morecombe bay, about fifteen miles south of Ulverston), wherein are found the broken pieces of old and bruised ships, and also the trunks and bodies, with the branches of old and rotten trees cast up their likeness, whereon is found a certain spume or froth, that in time hardeneth unto certain shells in shape like those of the muskle but

sharper pointed and of a whitish color, wherein is contained a thing in form like a lace of silke finely woven as it were together; one end whereof is fastened into the inside of the shell even as the fish of oisters and muskles are; the other end is made fast into the belly of a rude mass or lump which in time cometh to the shape and form of a bird: when it is perfectly formed the shell gapeth open and the first thing that appeareth is the aforesaid lace or string, next come the legs of the bird hanging out, and as it groweth greater it openeth the shell by degrees, till at length it is all come forth and hangeth only by the bill. In short space after it cometh to full maturitie and falleth into the sea, where it gathereth feathers and groweth to a fowl bigger than a mallard and lesser than a goose, which the people of Lancashire call by no other name than a 'tree-goose;' which place aforesaid and all those parts adjoining do so abound therewith that one of the best is bought for three pence."

Notwithstanding sage Gerard's emphatic declaration, "If any doubt, may it please them to repair unto me, and I shall satisfy them by the testimony of good witnesses," it is to be hoped the "people of Lancashire," and of every other shire, are no longer guilty of such credulity.

The Canada goose is a bird of considerable importance in the United States. In the Hudson's Bay territories, this animal is periodically anxiously looked for, and the Indian tribes of the neighbourhood call the month in which these birds arrive, the goose-moon. Dr. Richardson, in his "Fauna Boreali Americani," has the following notice of this bird, the Canada goose, and its migrations:—"The arrival of this well-known bird is anxiously looked for, and hailed with great joy by the natives of the woody and swampy districts, who depend principally on it for subsistence during the summer. It makes its first appearance in flocks of twenty or thirty, which are readily decoyed within gunshot by the hunters, who conceal themselves and imitate its call. Two, three, or more, are so frequently killed at a shot, that the usual price of a goose is the single charge of ammunition. One goose, which when fat weighs about nine pounds, is the daily ration of one of the Company's (Hudson Bay) servants during the season, and is reckoned equivalent to two Snow geese *(Anas hyperborea)*, or three ducks, or eight pounds of buffalo and moose-meat, or two pounds of ptarmigan,—or a pint of maize and four ounces of suet.

"About three weeks after their first appearance, the Canada geese disperse in pairs throughout the country, between the 50th and 67th parallels, to breed, retiring at the same time from the shore of Hudson's Bay. They are seldom or never seen on the coasts of the Arctic sea. In July, after the young birds are hatched, the parents moult, and vast numbers are killed in the rivers and lakes, when (from the loss of their quill feathers) they are unable to fly. When chased by a canoe, and obliged to dive frequently, they soon become fatigued, and make for the shore for the purpose of hiding themselves, but as they are not fleet, they fall an easy prey to their pursuers. In the autumn they again assemble in flocks, on the shores of Hudson's Bay, for three weeks or a month previous to their departure southwards."

Many of this species are now domesticated in this country, although not to such an extent as it clearly deserves. It will breed with the common grey goose, and by many it is considered that the hybrid progeny of this cross-breed is far superior in the flavour and quality of the flesh than that of the pure common breed. Buffon, the naturalist, says, that in his time many hundreds of the Canada geese inhabited the great canal at Versailles, where they bred familiarly with the swans. The Canada goose is more of a monogamist in a wild state than he is under domestication; but, as has been truly observed, "this may result from the plan of keeping but few males, and those in association with a flock of females, so that the ordinary results of pairing,—that is, retiring from the rest to a secluded spot, which the mated pair exclusively occupy,—are interfered with." Still, he does not altogether neglect the respectable example of his progenitors, but usually confines his attention much more to one particular female of the flock than to all the rest.

A popular writer on poultry has some very judicious remarks on the impropriety of excluding this species of the genus *Anser* from the poultry-yard, which opinion I can readily endorse from my own experience. "It is a question worth attention," says he, "whether the Canada goose might not with advantage be more extensively kept in our country than it is at present. It is common as an *ornament* to sheets of water in parks, gardens, and pleasure-grounds, but is too much neglected as a bird of *utility;* it is alike valuable for flesh and feathers; it is not so decided a grazer as is the common goose; the precincts of marshes and ponds which abound in aquatic vegetation, for

the procuring of which its strong bill and swan-like neck afford it facility, offer the most advantageous sites for its establishment, and in such localities we strongly recommend its adoption."

It is decidedly the most interesting and handsome bird of its tribe; its head, greater part of the neck, rump, and tail, are quite black; the beak and wings brown; and the underplumage brownish-grey; its bill and feet are also black. The Canada goose is also remarkable for its extraordinary sagacity, and several anecdotes are related which go a long way to prove its attachment to man. On the whole, I can, with great pleasure, recommend this bird to the reader as a very important member of the poultry-yard.

Lincolnshire has long been noted as a goose-breeding county. In the fens, it is no uncommon circumstance to find breeders owning from five to fifteen thousand geese. Among the poorer inhabitants prevails the curious custom of taking hatching geese to *nurse*. In every room, not excluding the bed-chambers, there is ranged round the walls, and one above the other, three rows of coarse wicker pens, which are subdivided into little cribs, each large enough to accommodate a goose. Twice a day an individual with a long rag-tipped stick, who calls himself a "gozzard" (probably a handy abbreviation of goose-herd), calls at the different houses for the feathered patients, takes them to water, and then brings them back again.

Were I a believer in apparitions and things supernatural, I would for ever eschew the use of a goose-feather bed. I should dread that the many geese that had suffered torture and death that I might lie lazily, would surround my pillow and keep my conscience a quake by quacking to me the anguish they endured for my sake whilst in the flesh; for, be it known to the Michaelmas reveller, be it known to him, who on a winter's night punches up his pillow and cuddles down cosily, that the creature to whom he is indebted for his gratification led but a wretched life, and that the first act of kindness shown to him was the wringing of his neck. For why? "Geese are plucked five times in the year. The first plucking is for quills and feathers, and takes place on Lady-day; and between that time and Michaelmas they undergo four more pluckings for feathers only. Six weeks old goslings even are not spared—their tail-feathers are plucked out, to habituate them to what they are to come to.

"Sitting round in a circle, with a hundred or so of geese en-

closed, the pluckers,—each with a coarse apron tied up to her chin,—go at their work as stolidly as though they were picking gooseberries off a bush, rather than feathers from a living creature. The old geese,—their skins having doubtless grown callous from constant plucking,—bear the operation as contentedly as one does having his hair cut; it is the goslings, with their tender baby-flesh, who make the noise: no one, indeed, but an experienced and granite-hearted plucker, could indifferently listen to the poor little things' plaintive 'quack, quack' for mercy. If the season prove cold, the mortality amongst the poor naked things is something alarming."

The only excuse for this barbarity is that feathers plucked from a live bird retain their elasticity, whereas feathers from a dead bird have no more life in them than there is in the carcase from which they are drawn.

It is, however, satisfactory to find that the poor geese who thus suffer so much pain at the hands of the myrmidons of the all-potent monarch, Fashion, are not entirely without champions, who, moreover, not only denounce the barbarous custom, but also suggest a remedy. Foremost amongst these may be mentioned a writer, now somewhat old, but whose "Treatise on Poultry" is a standard work of reference at the present time; I allude to Bonington Mowbray, who makes the following remarks on the practice of plucking geese: "A writer in the *Monthly Magazine*, December, 1832, remarks humanely on the cruelty of plucking the living goose, proposing a remedy which I should rejoice exceedingly to find practicable and effective. He remarks on the additional torture experienced by the poor fowl, from the too frequent unskilfulness and want of dexterity of the operator—generally a woman. The skin and flesh are sometimes so torn as to occasion the death of the victim; and even when the fowls are plucked in the most careful manner, they lose their flesh and appetite; their eyes become dull, and they languish in a most pitiable state, during a longer or a shorter period. Mortality has also been periodically very extensive in the flocks of geese, from sudden and imprudent exposure of them to the cold, after being stripped, and more especially during severe seasons and sudden atmospheric vicissitudes. There are many instances, in bleak and cold situations, of hundreds being lost in a single night, from neglect of the due precaution of comfortable shelter for so long a time as it may appear to be required. The remedy proposed, on the above authority, is as follows: Feathers are but of a

year's growth, and in the moulting season they spontaneously fall off, and are supplied by a fresh fleece; when, therefore, the geese are in full feather, let the plumage be removed, close to the skin, by sharp scissors. The produce would not be much reduced in quantity, whilst the quality would be greatly improved, and an indemnification be experienced in the uninjured health of the fowl, and the benefit obtained to the succeeding crop. Labour also would be saved in dressing, since the quilly portion of the feathers, when forcibly detached from the skin, is generally in such a state, as, after all, to require the employment of scissors. After this operation shall have been performed, the down from the breast may be removed by the same manner."

Our neighbours, the French, have little appetite for goose. They say it is coarse and unwholesome, and are as much amazed that apple-sauce should be served with the bird, as some of us are that frogs and dandelions should be found agreeable to French palates. They, however, do not object to a wing or a thigh nicely baked in a pasty, and are passionately fond of *pâté de foie gras*, or fat liver pie. And how do you think the material for this savory *pâté* is obtained? "The wretched geese are nailed by the feet to a board, placed before a hot fire, crammed with food and supplied with drink; and it is in this dreadful condition, that while fear wastes away their flesh, the liver becomes enormously large!" Bear this in mind, O English visitor to the "most elegant city in the world," and when in a bill of fare your eyes encounter *pâté de foie gras*, think of the poor brute roasting alive and pass on to the next item.

My experience in goose-breeding has been but limited,—it has been successful, however. I have a friend whose dealings in goose-flesh have been extensive, and no less successful than mine own The system we pursue is not original; it is not old—no older indeed, than Bonington Mowbray's "Practical Treatise." To Mr. Mowbray have we stood indebted for many a delicate "green" goose, and many a fine-flavoured full-grown bird; therefore, in this case, I can do the reader no better service than place before him my own lesson.

"A gander and five geese comprise a single breeding stock. The goose sits upon her eggs twenty-seven to thirty days, covering from eleven to fifteen eggs. A nest should be prepared for her in a secure place, as soon as carrying straw in her bill, and other tokens, declare her readiness to lay. The earliness and warmth of the spring are the general causes of

the early laying of geese, which is of consequence, since there may be time for two broods within the season, not, however, a common occurrence; and which happen successively for two or three seasons, has occasioned some persons formerly to set a high price upon their stock as if a peculiar and more valuable breed than the common. The method to attain this advantage is, to feed breeding-geese high throughout the winter, with solid corn, and on the commencement of the breeding season to allow them boiled barley, malt, fresh grains and fine pollard, mixed up with ale and other stimulants. . . . . With a gander present no mischief can happen to the sitting geese—he sitting sentinel at the chamber-door of his wives. With respect to feeding the goose or duck upon the nest, it may be occasionally required, but is not a thing of much account, since they will generally repair to the water sufficiently often from their natural inclination. The goose will not quit before she has completed her hatch, nor will it be practicable to take any of the goslings from her were it necessary, as she is too strong and resolute, and might kill some in the struggle.

"It has been formerly recommended to keep the newly-hatched in the house during a week, lest they get cramp from the damp earth, to which they are indeed liable; but we did not find this indoor confinement necessary, penning the goose and her brood between four hurdles, upon a piece of dry grass, well sheltered, putting them out late in the morning, or not at all in severe weather, and even taking them in in the evening. Sometimes we have pitched double the number of hurdles for the convenience of two broods, there being no quarrels among this social and harmless part of the feathered race, so unlike those quarrelsome and murderous fellows the common fowls. We did not even find it necessary to interpose a parting hurdle, which, on occasion, may always conveniently be done.

"The first food, similar to that of the duck, but with some cooling greens, clivers, or the like intermixed,—namely, barley-meal, bruised oats, or fine pollard.

"For the first range, a convenient field containing water is to be preferred to an extensive common, over which the gulls of goslings are dragged by the goose, until they become cramped or tired, some of them squatting down and remaining behind. It is also necessary to destroy all the hemlock or deadly nightshade within the range of the young geese, many of which drop off annually from eating that poison when the cause is not suspected. I know not that the elder geese will

eat hemlock, but I believe that both the young and old have been occasionally killed by swallowing slips of yew.

"The young becoming pretty well feathered will also be too large to be contained or brooded beneath the mother's wings, and will then sleep in groups by her side, and must be supplied with good and renewed straw beds, which they convert into excellent dung. Being now able to frequent the pond, and range the common at large, the young geese will obtain their living, and few people, favourably situated, allow them anything more except the vegetable produce of the garden.

"It has, however, been my constant practice always to dispense a moderate quantity of any solid corn or pulse at hand, both morning and evening, and the going out and returning of the geese, together with such greens as happened to be at command: cabbage, mangold leaves, lucerne, tares, and, occasionally, sliced carrots and turnips. By such full-keeping our geese were ever in a fleshy state, and attained a large size.

"Geese managed after the above mode will be speedily fattened green, that is, at a month or six weeks old, or after the run of the corn stubble. Two or three weeks after the latter must be sufficient to make them thoroughly fat; indeed, I prefer a goose fattened entirely in the stubbles, granting it to have been previously in good case, and be full-fed in the field. But when needful to fatten them, the feeding-houses already recommended are most convenient. With clean and renewed beds of straw, and plenty of clean water; oats, crushed or otherwise, pea or bean-meal or pollard; the articles mixed up with skimmed milk, where the article can be obtained, will fatten geese pleasantly and speedily. Very little greens of any kind should be given to fattening geese as being too laxative, and occasioning them to throw off their corn too quickly; whence their flesh will prove less substantial and of inferior flavour. . . . . It may be added, that oat-meal, or pea-meal mixed with oatmeal, form an excellent feeding article for ducks and geese."

DISEASES OF POULTRY AND THEIR CURE.

Among the chief diseases to which poultry of all kinds are liable may be mentioned the following:—

Inflammation of the rump-gland or *roup*.—Let the swelling be opened by a lancet, and the matter gently squeezed out; afterwards foment well with warm water; put the bird upon a diet of oatmeal and green vegetables, and, if necessary, give

a teaspoonful of castor-oil. Be sure that the roosting-place is clean and well ventilated.

Gapes (inflammation of the trachea) is a disease to which all our domestic gallinaceous birds are subject, and which often occasions great mortality. It is indicated by running at the nostrils, watery eyes, alteration of voice, and loss of appetite and spirits. If the bird dies and the trachea be examined, it will be found replete with narrow worms, about half an inch in length. "This singular worm," says a recent writer, "is the *Syngamus trachealis*, or *Distoma lineare*. It consists of a long and a short body united together; the long body is the female, the short body the male; each, were it not that they are permanently united together, being an animal distinct and perfect in itself. Whether these parasitic worms are the cause or consequence of the disease, we pretend not to say, nor can we tell how they become introduced into the trachea: this, however, seems certain, that their removal is requisite to give the feathered patient a chance of recovery. This can be done by means of a feather, neatly trimmed, which is to be introduced into the windpipe, and turned round once or twice, and then drawn out. It will dislodge the worms, and bring back many of them adhering with slime unto it. This plan requires great dexterity, and some knowledge of the anatomy of the parts: a slow, unskilful operator may kill the already half-suffocated bird, instead of curing it. Another mode of destroying these worms is, by putting the birds in a box, and making them inhale the fumes of tobacco, thrown into it through the stalk of a tobacco-pipe. Some recommend the forcing of tobacco-smoke down the bird's throat, and others that the mouth be crammed with snuff; while many place faith in the efficacy of a pinch of salt, introduced into the back part of the mouth. Something like a scientific mode of treatment may, however, be suggested. Give a grain of *calomel*, made up with bread into a pill, or two or three grains of Plummer's pill (*pil. hydr. submur. co.*, London Pharmacopœia); after which let flour of sulphur be administered, with a little ginger, in pultaceous food composed of barley-meal. In the mean time, let the bird be kept in a dry warm shed or room, apart from the rest of the fowls, as the disease may be infectious. Let the mouth and beak be washed with a weak solution of chloride of lime."

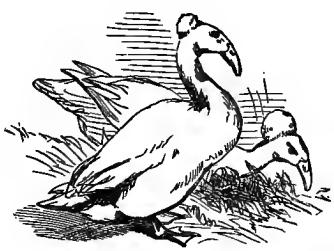
Asthma.—When fowls are affected with this complaint, it is evidenced by difficulty of breathing and a wheezing, rattling

noise on inspiration. It is the result of a thickening of the bronchial tubes from previous inflammation, often accompanied by an alteration in the structure of the cellular tissue of a portion of the lungs. There is little hope for an asthmatic fowl.

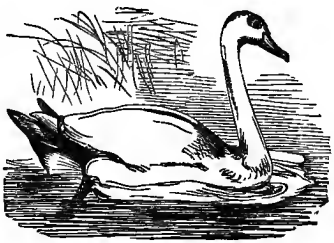
Diarrhœa may be generally cured by a change of diet, and a little chalk given in gruel.

Constipation of the bowels will yield to castor-oil, and a diet upon oatmeal porridge and green vegetables.

Moulting. — This process is natural, and consists in the gradual exchange of old feathers for new ones. Nevertheless it often happens that birds in a state of domestication have not sufficient vital energy for the accomplishment of the change. They require improved diet, warmth, and good water. Of course their roosting-place must be properly sheltered and ventilated. A grain or two of cayenne pepper, made into a pill with bread, may be given daily with advantage. Saffron is useless; but a nail, or any bit of iron, may be put into the drinking-trough, in order to render the water chalybeate.



BOW-BILL DUCKS.



THE CYGNET.

SWANS.

ALTHOUGH these handsome birds bear some resemblance to the geese and duck family, they have been by modern naturalists separated from the rest of the genus *Anas* into a distinct group of their own. There are six varieties of the swan known in England: The Mute Swan, the Whooper or Whistling Swan, the Bewick's Swan, the Polish Swan, and the Australian and Chilian, or Peruvian Swan. The mute swan is the most common in this country, and it is this bird which is usually seen on park-waters and pleasure-grounds. It is a large bird, measuring four feet and a half in height, and seven feet from the tip of one wing to the other. Its plumage, as is well known, is snowy white. During the first year the feet are black, in the second year they change to leaden-grey, and lastly, reddish-grey. Jesse, in his "Gleanings," well describes the habitat of the swans on the river Thames, with which birds my readers are no doubt familiar. He says:—"Living on the banks of the Thames, I have often been pleased with seeing the care taken of the young swans by the parent birds. Where the stream is strong, the old swan will sink herself sufficiently low to bring her back on a level with the water, when cygnets will get upon it, and in this manner are conveyed to the other side of the river, or into stiller water. Each family of swans on the river has its own district; and if the limits of that district are encroached upon by other swans, a vindication of local rights immediately takes place, and the intruders are driven away. Except in this instance, colonies of swans appear to live in a state of the most perfect harmony. The male is

very attentive to the female, assists in making the nest, and, when a sudden rise of the tide takes place, joins her with great assiduity in raising the nest sufficiently high to prevent the eggs being chilled by the action of the water, though sometimes its rise is so rapid that the whole nest is washed away and destroyed."

Of its attachment to its young there can be little doubt. I have often, while boating on the Thames, amused myself with attempting to get at its nest. The female and male have always combined to resist the seeming attempt at depredation, sailing round and round the boat, and snapping most angrily at the sculls, seeming to know that *they* were the principle objects of dread.

The mute swan builds its nest of rushes, reeds, and various plants; and lays about six or seven eggs. The amount of food that should be given to this bird varies, of course, in proportion to its own opportunities of foraging for itself. Says a good authority:—"When in a great measure dependent on given food, each will eat the eighth part of a peck of barley daily; this may be now and then varied with oats." A writer in the *Poultry Chronicle*, above referred to, states that they relish the sweepings of the pigeon loft, in which the peas and beans, if thrown into the water at the edge, soon become clean. He also states that they like a little grass when the lawns are mown, and once a year a wheelbarrowful of watercress. When the cygnets first take to the water, they may be fed with oatmeal scattered on the surface.

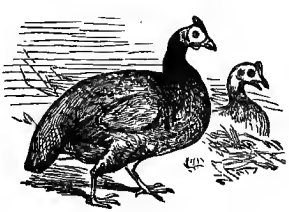
The other varieties of swans are by no means so common. The whooper or whistling swan is a native of northern countries, and in Iceland is a great favourite; as the cry of the cuckoo is in this country an indication of the approach of spring, so, in those cold and cheerless regions, the cry of the swan is hailed as the harbinger of more genial weather. Bewick's swan is still more uncommon, and also a native of northern latitudes. The Polish swan bears some resemblance to our common tame swan, only that the cygnets are white instead of grey. The black swan is peculiar to Australia and New Holland, and is a very hardy bird, which will breed and thrive well in this country. Some good specimens may be seen in the Regent's Park grounds.

The Chilian swan is a native of South America; its plumage is white, with black head and neck; and is rather a pretty species.

The swan must not only be regarded as an ornament to pleasure-grounds and parks, but also as a bird of great utility. For the *discovery* of the latter quality, it is said, we are indebted to the late Marquis of Exeter. On the estate of this nobleman, at Burghley, there was a sheet of water which was so overrun with weeds, that their destruction gave employment to three men six months of the year. At last, in 1796, two pair of swans were introduced by the marquis, and soon a great and remarkable change took place: in one year the whole expanse of water was completely cleared of weeds, and so remained; the swans devouring the weeds as soon as they began to spring up.

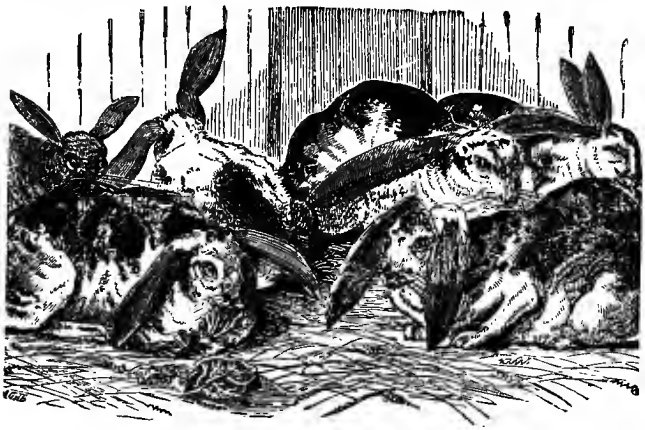
The cygnet, or the young swan, was formerly much esteemed; but it has "fallen from its high estate," and is now rarely seen upon the table. We are not sure that it is not still fattened at Norwich for the corporation of that place. Persons who have property on the river there take the young birds, and send them to some one who is employed by the corporation, to be fed; and for this trouble he is paid, or was wont to be paid, about a half a guinea a bird. It is as the future bird of elegance and grace that the young swan is mostly admired; when it has become old enough to grace the waters, then it is that all admire her,—when she with—

> "Archèd neck,
> Between her white wings mantling, proudly rows
> Her state with oary feet."



GUINEA-FOWLS.

THE COMMON BROWN RABBIT, THE WHITE ANGOLA RABBIT, A BLACK AND WHITE LOP-EARED RABBIT.



THE RABBIT.

The value of this little animal to man is much more considerable than at first sight appears. Its fur is used in the manufacture of hats, and in place of down and feathers, as stuffing for beds; its skin is of use to the glove-makers and the glue-maker, and its flesh forms no trifling item of the amount of animal food consumed annually in England. Home produce has, however, but very little to do with this latter business. Belgium would seem to be the rabbit-field of Europe. Judging from the immense quantities shipped weekly from Ostend, one might imagine the whole surrounding country one vast warren, and the inhabitants warreners to a man. I know at the present time one London firm whose weekly consignment in the season is fifteen tons of rabbits; not, it must be borne in mind, encumbered by skins and offal, but skinned, gutted, and trimmed ready for the spit or pot. Take these rabbit carcases as averaging in weight four pounds each, and we have something over four thousand animals each week. Taking the season to last six months, this gives us *eighty-four thousand* rabbits killed and consigned to one among many existing London rabbit importers.

As far as may be gathered from arithmetical calculation, rabbit breeding must be a very profitable business. Pennant

says, "Rabbits will breed seven times a year, and bring eight young ones each time. On a supposition that this happens regularly during four years, their numbers will amount to 1,274,840." Supposing these rabbits, little and big, to be worth no more than sixpence each, here is an opportunity of realizing a princely fortune in four years—*on the supposition* that so many rabbits would in that short period spring from the inexpensive buck and doe by which the business was started. It would, however, be altogether out of the scheme of nature that such a result should come about. Neither the seven litters a year nor the eight young ones at a litter could be guaranteed, and rabbit flesh is surely "heir" to as many ills as human. Pennant should have taken the pains to calculate what a difference to the grand total would have appeared, had only ten out of his growing multitude of rabbits died during the first six months—a much more fair supposition than that they should all live and do well. The above-mentioned is, however, by no means a solitary instance of fortunes guaranteed (on paper) to rabbit-breeders. A few years ago there was published in Paris, by one M. Despouy, a pamphlet clearly demonstrating that it needed but an outlay of twenty pounds per annum to insure to a rabbit farmer at least £800 a year.

About fifty years ago, there existed in this country two or three wholesale breeders of rabbits, each of whom kept from fifteen hundred to two thousand breeding does. The speculation was, however, discontinued, partly on account of the sheer unprofitableness of the speculation, and partly through the complaints of the surrounding farmers, whose properties were in a fair way to ruin on account of the nightly ravages of the furry multitude. Mowbray, who wrote about thirty years ago, says, "The only considerable rabbit-feeders of whom I heard were two gentlemen, the one resident in Oxfordshire, the other in Berks. The former fed some hundreds, and then it was said intended to double his stock. The huts were placed in a small building set apart for that purpose. The then stock produced one load of dung per week, two loads of which were sufficient to manure one acre of land. Three dozen of rabbits per week were sent to the London markets, but, keep and attendance reckoned, no other profit accrued, excepting the dung, the price of which used to be eightpence per bushel, and I believe thirty-six bushels are reckoned a load. The Berks gentleman, according to the custom of that county, fed white rabbits on account of the superior value of their skins." The

same authority declares his opinion, that rabbits at large must always suffer in point of profit by loss of number than they gain by cheaper feeding, exclusive of the mischief they do; and that this principle operates proportionally in limited enlargement, as in the unlimited upon the warren.

Dr. Alfred Smee, speaking of the nest of the wild rabbit, says, "The female, when about to give birth to young, leaves the warren and goes to some distance, perhaps one, two, or three fields. She then scratches a hole, two, three, four, five, or even more feet in length; but still it is a mere hole in the ground and would be quite unfit to receive the little rabbits at birth. To make the bed suitable, she pulls off from her own body a good hatful of down, which makes a nest as warm and snug as may be desired. She does not stop continually with the young, but lives in the warren. In the dusk of the evening she stealthily runs to the nest to suckle her young ones. Before she returns she carefully covers over the hole, leaving a very small space for the air to enter; and she has to remove the covering whenever she visits her offspring. I have often been delighted in watching these precautionary measures: and, on one occasion, a rabbit wandered into the garden of a house where I was stopping, and so I had a capital opportunity of watching her proceedings as she returned nightly to visit the nest. When I judged that the young ones were sufficiently strong, I took the nest. In the evening the old rabbit came as before, went into the hole, saw that all her little ones were gone, took one look round, and ran away as fast as her legs would carry her to the warren, and never returned to the spot." If the nest of the rabbits is the least disturbed, the old one finds it out on her next visit, and for ever deserts her progeny. The worthy Doctor goes on to argue that, since whatever number of rabbits' "nests" we examine, they all exhibit the same design, and that even in the domestic state, where from being confined in hutches the rabbit cannot burrow, she makes her nest in a dark chamber, and still pulls off the down; it cannot be doubted that the proceeding is a purely instinctive operation, and not in any way derived from experience.

The reason of the doe's quitting the warren to build a sly cradle for her coming young ones would appear to be the unnatural and bloodthirsty disposition of the buck. He seems to entertain the notion that baby rabbits—no matter though they be his own—are troublesome little wretches, and much better

out of the world than in it, and seconds his opinion with his cruel teeth whenever he finds a chance.

I never myself had the pleasure of observing the behaviour of rabbits when in a wild condition; the following description, however, by the Rev. J. G. Wood, will give the reader a capital notion of what a rabbit warren is like:

"To see rabbits at their best, it is necessary to be concealed closely in their immediate vicinity, and watch them in the early morning or the fall of the evening. No one can form any true conception of the rabbit nature until he has observed the little creatures in their native home, and, when he has done so, he will seize the earliest opportunity of renewing his acquaintance with the droll little creatures. To describe the manifold antics of a rabbit warren would occupy a considerable space. The little animals are such quaint, ludicrous beings, and are full of such comical little coquetries, and such absurd airs of assumed dignity, that they sorely try the gravity of the concealed observer, and sometimes cause him to burst into irrepressible laughter to their profound dismay.

"At one time they are gravely pattering about the doors of the subterranean homes, occasionally sitting upright and gazing in every direction as if fearful of a surprise, and all behaving with the profoundest gravity; next moment some one gets angry, and stamps his feet upon the ground, as a preliminary observation before engaging in a regular fight. Suddenly a whole party rush at full speed, scampering over the ground as if they meant to run for a mile at least, but, unexpectedly, stop short at an inviting tuft of herbage, and nibble it composedly as if they had not run a yard. Then a sudden panic will flash through the whole party, and, with a rush and a scurry, every rabbit leaps into its burrow, and vanishes from sight like magic. The spot that was so full of life a moment since is now deserted as though it had been uninhabited for ages; but in a few minutes one little nose is seen cautiously poked out of a burrow, the head and ears follow, and in a very few minutes the frightened rabbits have come again into the light of day, and have recommenced their interrupted pastime."

In its native state the rabbit is of a uniform brown colour. It exists exclusively on vegetable food, and, as everybody knows who resides near a warren, most destructive and wantonly mischievous neighbour. Not only do the smaller green things suffer from their depredations, but young trees are often utterly ruined through the destruction of the bark about their

lower parts. It would somewhat abate the annoyance if they were known to be passionately fond of tree bark and ate of it whenever they found a chance, but it must be admitted as somewhat exasperating to find your promising trees naked as high as a rabbit standing on his hind legs could reach, and all the bark lying in ribands about the ground. It is possible that they may sometimes eat the bark, but it would seem that the chief object is to trim and sharpen the claws, as cats trim theirs against the legs of our chairs and tables.

It may not be here out of place to put the reader in possession of a hint on the above subject, some time ago presented to the world by a naturalist and rabbit-keeper of some repute. "When the rabbits have begun to devastate a plantation, they will continue their destructive amusement till they have killed every tree in the place unless they are effectually checked. There are only two methods of saving the trees, one of killing all the rabbits, and the other of making them disgusted with their employment. The latter plan is generally the most feasible, and can be done by painting each tree with a strong infusion of tobacco mixed with a sufficiency of clay and other substances to make it adhere to the bark. This mixture should be copiously applied to the first three feet of the root of every tree, so that the rabbit cannot find any portion of the bark that is not impregnated with the nauseous compound, and is an effectual preservative against their attacks."

The burrow of the rabbit is an irregular and complicated contrivance, as it had need be, considering the number of enemies continually on the alert to work his destruction. Stoats, weasels, and ferrets, are among the rabbit's most deadly and bloodthirsty enemies; indeed, when the latter animal is employed by the professional warrener to hunt rabbits out of their burrows, it is necessary to muzzle its sharp jaws with a leather muzzle or a loop of cord. If this should happen to slip off during the hunt, the warrener will see no more of his ferret; it will take up its abode in the warren, living like a prince—that is, like a Dahomian prince—till the approach of winter, when the poor rabbits are relieved of their sanguinary foe, who one morning is found frozen to death. Foxes, too, are particularly fond of young rabbits, and though they cannot follow them into their burrows like the stoat and the ferret, have a very ingenious method of digging them out. Cats have been known to yield to the temptation of a rabbit warren in the vicinity of their master's house, to turn from peaceful

and domestic ways and, taking to the woods, become vagabonds and rabbit poachers till the end of their days. Terrier dogs will sometimes be bold enough to enter a burrow to give chase to its furry occupant. Not invariably with impunity, however. There have been known cases where from one part of its burrow the rabbit has watched the dog enter at another, and stealthily coming behind, blocked up the passage with earth so effectually, that had it not been dug out, the dog would certainly have starved to death in its dark prison.

It is generally supposed that the rabbit has a great antipathy to the hare, and that a "cross" between the species was not possible. There has, however, been introduced to French tables an animal called the "Hare-rabbit," partaking of the nature, characteristics, and qualifications of both the hare and the rabbit. It is highly spoken of, both as regards flesh and flavour; and it is said to be the only hybrid which is able to perpetuate its race. We hope that some enterprising individual will soon secure for English tables what would seem to be a really valuable addition to our other game and poultry dishes; although it will be rather difficult to exactly assign its proper position, as within or without the meaning of "game," as by law established. Only a few specimens have been seen in England at present; but there is no reason to doubt that our rabbit-fanciers will prove equal to the occasion, and cope successfully in the kitchen matter, as in all others, with our neighbours across the Channel.

Where natural warrens do not exist, artificial ones are sometimes constructed; but this can, of course, only be done in situations where the soil is favourable. As the author of "British Husbandry," however, observes, that though warrens are found to return a large per centage on the capital employed, the animals are so destructive of fences and growing crops, that the land on which they are maintained appears in a state of desolation; and that they are notoriously such bad neighbours, that however profitable they may be, they are considered as a public nuisance, and efforts are constantly made to annihilate them. The expenses attending the maintenance of a warren are very considerable. There are warreners' wages, cost of traps and nets, repair of fences, and the destruction of such vermin as are inimical to the well doing of the stock.

"In Glamorganshire," says a recent writer, "there is an enclosed warren of 1,600 or 1,700 acres within a wall. It is

stocked with various kinds of rabbits, and produces a very good income, probably as much as £1,600 a year. One foreign customer has paid as much as £800 per annum for skins of one particular variety, for the German fairs, whence they travel into Russia and the East."

In another county, according to the same authority, on a farm of two thousand six hundred acres, a portion only of which was warren, the skins and flesh of the rabbits paid the rent, beside the expense of the warreners. Of those officials there were seven, with dogs and implements in abundance. Besides wages, they were allowed all the rabbits they could eat, and bread, bacon, vegetables, beer, &c., from the farm-house, to be consumed in their huts on the warren, where they cooked, in hermitlike solitude, for themselves. During the killing season they worked in the night, finishing off at about two in the morning. This took place every night, Sundays excepted. The catch was immediately "hulked," or disembowelled, coupled, and then sent off to London in regular vans. During the day false burrows were dug in the portion of the warren to be worked in the evening, which was afterwards partially encircled with a net. When the rabbits came out to feed, they were driven by dogs and beaters into the enclosure. Taking refuge by droves in the false burrows, they were easily canght by the men; those that escaped thence were intercepted by the nets. One bright moonlight night, when we witnessed the chase, two hundred couple were taken. The dogs not being allowed to touch them, very few rabbits, indeed, were mangled or torn. Stretching their necks was the mode of death. In some existing warrens, rabbit-traps, like large rat-traps, are made use of, and were occasionally employed here. Five hundred acres of the warren were subsequently broken up and cultivated, which materially diminished the value of the farm.

The warren is, however, an affair of too great magnitude to tempt many of my readers to embark in such a speculation, despite the profit to be made. Before, however, we come to the modest and familiar hutch, it will be proper to make mention of two other contrivances for the maintenance of rabbits, and which may have attractions for such as have plenty of money and enough love for rabbit-keeping to devote thereto a goodly share of it, together with a few spare hours each day. The following is the description of a "rabbit court," planned by a gentleman who should know all about such matters.

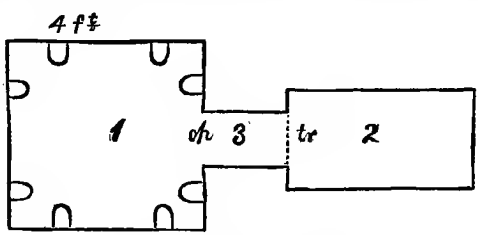
"Two sides of a paved court-yard may be bounded by tall buildings, as houses or stabling; if they stand to the north-east so much the better. The other two sides should consist of a wall, not more than five feet high, to admit air and sunshine. For security from intrusion without, and to confine any fowls that may be kept within, palings may be fixed to the top of these low walls without any inconvenience arising. The great object is to have the court at once airy, sunshiny, sheltered, and secure. In one or two corners of the court, or against one or two of its sides, there should be thrown a broad heap of earth and rubbish, eighteen inches lower than the top of the wall. In this the rabbits will burrow and amuse themselves, though it is better to prevent the does from nesting there, for fear of the attacks of cats and rats. The buck, if one is kept, must be retained a close prisoner in a box of his own. The breeding does, when their time of kindling approaches, will be comfortably settled in separate hutches, to be described hereafter. The day when each doe is to bring forth will be known from the stud book, even if it is not indicated by the preparations she makes, such as carrying about straws and haulm in her mouth, and biting them into separate lengths. The rest of the stock will associate indiscriminately in the court, with the sole exception that all the males will be withdrawn as soon as they get to such an age as to prove troublesome, and that young ones, just weaned, *i.e.* from six to eight weeks old, will be kept in a hutch by themselves till they grow strong enough to join the general herd. For the rabbits which remain at large in the court, a few small brick houses at the foot of the wall, with their doors constantly open, and the burrows they will make in the earth, will prove a sufficient shelter at night and during bad weather. They will also make a similar use of any logs of wood, hen-coops, or faggots that may be lying or standing about the place at random.

"The easy management of such a rabbit-court as this is obvious. Food, either green or dry, has only to be scattered on the pavement of the court. The small proportion of individuals in confinement will, of course, require extra attention. The chief thing, however, is to attend to them regularly and unfailingly. Rabbits so kept are much more amusing objects than when they are constantly hidden from sight in their hutches. Their gambols are seen—their cleanly habits in brushing their fur coats—and even the petty quarrels and jealousies which continually arise from the

elder ones striving for mastery. They will become as tame as to eat out of the hand, and to flock round their feeder when he enters with a bundle of vegetables or straw. The whole stud should be so liberally supplied with provender that those intended to be eaten may be able to fatten upon it, and the growing and the breeding rabbits will amply repay the share they consume of this liberal diet by the rapidity with which they come to hand, and the strength and shapeliness of the litters they bring forth. A rabbit-court like this is particularly convenient for consuming the refuse and sweepings of a large kitchen-garden and flower-garden, and even a portion of the scourings of the stable. Forkfuls of litter, which a neat groom will cast out of doors, will be nibbled over and relished by his minor charges. In short, we strongly recommend a rabbit-court to those whose premises and situation allow of such a plan being adopted."

Another artificial structure, imitating in some degree the natural rabbit-warren, is the "rabbit-pit." Various forms have been suggested for this, but the most practicable is that of a correspondent of the *Agricultural Gazette*:—

"In the Isle of Thanet, on the east coast of Kent, the writer witnessed and superintended on his own property the method which he now proceeds cursorily to describe, and the annexed diagram will tend to define the limits of the spaces required.



GROUND PLAN OF RABBIT-PIT.

No. 1 represents a pit four feet on each side of the square; 2 is an oblong, four feet long and about two feet broad. Both are dug to the depth of six feet, perfectly level at the bottom and sides, the latter so much wider than the wooden curbs as to admit of a facing of four-inch brickwork in cement, excepting the spaces to admit of about six arched openings (as marked), of dimensions sufficient for the passage of the largest

rabbit. 2 is the feeding department; 3 is only an arched passage tunnelled at the ground level of the bottom of the two pits, about a foot wide and broad, to serve as a communication between the pits. This is also bricked and arched, but is not seen at the top. A covering of oil-cloth is added to the curb of each pit, and the cloth extends over the frame several inches beyond the curb, in order to prevent the entry of the heaviest rain. At the place, *o p*, the arched passage is always open; and so it is also at the other extremity marked *t r*, excepting only when any of the rabbits are to be taken. Dryness is essential to the prosperity of this animal; therefore the soil should not only be naturally dry, but must be protected above, and kept secure at the sides and bottoms of the pit by the best brickwork. From what has been stated, it will be understood that a sound chalky or sandstone rock forms by far the most appropriate medium for the warren, which the rabbits burrow into, and excavate according to their own requirements. Four does and a buck may be reckoned a good breeding stock; and something of the kind was found when the writer purchased the property in the Isle of Thanet. The experience of about two and a half years proved the correctness of the facts thus stated; and little more remains to be said on the availability of a practice which, while it secures the rabbits, preserves something of their wild nature. The variety generally introduced by the Thanet people was the one called brown: the hardy silver-haired would be desirable, if it could be procured. Sometimes a black rabbit was produced among the young ones of a litter. In feeding twice a day, the cabbage-leaves and carrot-tops of the garden were thrown into the feeding-pit, always free from wet, but not particularly air-dried or contracted by exposure. Some coarse pollard and a few oats, mixed, were let down in a trough attached to a long handle. The opening, *t r*, was fitted with a trap-door, working freely in grooves, and furnished with a string and loop to keep it up. To this a much longer string was tied, and made to act perpendicularly, when any were to be taken, previously to which a meal or two was omitted. The simple machinery being then adapted, hunger induced a rush to seize the green food thrown down; and after waiting a few minutes it rarely happened that a sufficient number was not secured by the fall of the trap to admit of a proper selection for table use. Some cautions suggest themselves. No useless trappings must be indulged in; the man who holds the long string must not be seen. The passage

should always be open at other times, and the covering-screen kept on constantly, unless some operation be going on."

That the wild rabbit—at least, if taken in hand when very young—is capable of speedy domestication, is proved in a pathetic story sent by a lady to Mr. Jesse. "One evening last spring my dog barked at something behind a flower-pot that stood in the door-porch. I thought a toad was there, but it proved to be a very young rabbit—a wild one. The poor thing was in a state of great exhaustion, as if it had been chased and had been a long while without food. It was quiet in the hand, and allowed a little warm milk to be put into its mouth. Upon being wrapped in flannel and placed in a basket by the fire it soon went to sleep. When it awoke more milk was offered in a small spoon, which this time was sucked with right good-will; and the little creature continued to take the milk in this way for several days until strong enough to help itself out of a cup. It appeared to become tame immediately, soon learnt its name, and I never saw a happier or a merrier pet. Its gambols on the carpet were full of fun. When tired with play, it would feed on the green food and nice bits placed there for it, and when satisfied it used to climb up the skirt of the dress, nestle in the lap or under the arm, and go to sleep. If this indulgence could not be permitted, then Bunny (as we called it) would spring into my work-basket, and take a nap there. At midday it liked to sit in the sun on the window-seat, then it would clean its fur and long ears, each being separately drawn down and held by one foot while brushed by the other. This duty performed, it would stretch at full length, and, basking in the sun, fall asleep. Strange to tell, all this was going on with the dog in the room, who had been made to understand that the rabbit was not to be touched. Stranger still, the rabbit ceased to show any fear of the dog, but, on the contrary, delighted in jumping on the dog's back, and running after its tail. These liberties, however, were not pleasing to Jewel; they were evidently only endured in obedience to the commands of his mistress. Not approving of one favourite being made happy at another's expense I was obliged on these occasions to interfere and call Bunny to order.

"Being frequently told that a wild rabbit could not be so thoroughly domesticated, but that it would return to the woods if it regained its liberty, I feared that if mine got loose it would certainly run away; yet I wished it should be sometimes in the garden, to feed upon such green food as it liked best; for this

purpose I fastened it with a collar and a small chain, and thus securely led it about. One evening the chain unfortunately broke, and Bunny was free. At first we saw it running from place to place with wild delight, but after a little while we could not see it, and we hunted in vain under the shrubs, calling it by name, until it became dark; we then ceased to search any longer, and I concluded that my pretty pet was gone.

"Before retiring for the night I gave a last look out of the window, in the hope I might chance to see it once more. The moon was then shining brightly, and I distinctly saw my little rabbit sitting at the door, with head and ears erect, as if listening for its friends within, anxious, perhaps, for its accustomed nice supper and soft warm bed. I hastened down stairs to let it in, calling it by name, when the moment I opened the door a strange cat darted forward, seized it by the neck, and bore it screaming away. Of course effort of mine was useless to overtake the cat."

Only that the above-mentioned unfortunate rabbit was taken unaware, and considering that it was four months old, and had an ample share of wild blood in its veins, savage grimalkin might have come off but second best. I know of a case of a cat who lived at a house where fancy rabbits were kept. Being creatures of meek spirits and much subdued, a mere glance from puss towards the rabbit-hutch was enough almost to make the hair of every butterfly-smut and oarlop stand on end, and emboldened by these evidences of their terror, she never lost an opportunity of approaching their hutches, and spitting and nsing all sorts of abusive language through the bars. This little amusement was, of course, checked as much as possible by the rabbit-keeper, who, to cure the cat, was accustomed to rasp her unlucky nose against the door-wires whenever she was caught close thereto; but this only seemed to increase her spite, and with her smelling-organ in process of excoriation, she would thrust her leg between the bars, and endeavour to maul the creatures within. One day, however, there arrived at the rabbit-keepers' abode a three-quarters grown wild rabbit from Lincolnshire. The animal came in a hamper, and having no convenient hutch to put it in, it was allowed to remain in the basket till the next morning; that is, an opportunity of so doing was afforded it, but it was not the wild young buck's nature to submit to imprisonment while he had sharp teeth in his head, and only osier bars between himself and liberty.

He set to work, and just at daylight succeeded in gnawing a

hole of sufficient size to squeeze through. This latter operation was just concluded when the rabbit-keeper happened to look into the room. The emancipated rabbit was not alone; a few feet off was that deadly enemy to rabbit-kind, the cat, evidently not yet quite recovered from her joyful surprise, that here was one of her foes—all alone, plump, and tender, delivered fairly into her claws. She lay flat on the ground, as does a tiger when he makes comfortably sure of his prey; and, like the tiger, she leisurely waved her tail from side to side. As for the young buck from the country, he too seemed rather astonished, and sat upright, regarding puss with eyes wide open, and with an air of amusement rather than fear. Presently the cat, thinking it time to proceed to business, made a swift and sudden leap; but the buck, equally nimble, sprung up at the identical moment, and cleared the cat's back, striking out with his horny hind feet, and striking his enemy so smart a blow as sent her flue flying. The cat, evidently unprepared for anything like fight in an animal shaped like those among which she was accustomed to play the tyrant, seemed taken considerably aback, and for the next few minutes confined her pugnacious demonstrations to snarling, stiffening her bushy tail, and showing her teeth; while the buck, sitting at the end of the room, rubbed his nose with his fore-paws, and seemed to regard the entire business as rather a good joke. Still, on mischief bent, the cat dropped flat to her belly, and keeping her green eyes on the rabbit, commenced to draw herself along the floor towards her enemy. Her enemy was nothing averse to another round. Before she had nearly reached him, he made another spring, and this time having a fairer chance than before, gave her such a tremendous double kick that she uttered a short, sharp cry, and bolted into an empty barrel that stood in the room. Finding that she evinced no disposition to renew the combat, my friend opened the door, when, in a moment, the cat leaped from the barrel, and scuttled off as though she had a squib at her tail.

A correspondent sends me a little narrative of how he "cured" a cat of rabbit-stealing, which certainly is commendable for ingenuity rather than humanity. Haunting the garden where his rabbit-hutches stood, was a gaunt, grey tom cat, of ruffianly habits, whom nobody owned, and who, doubtless, had been a burglar and a thief from his kittenhood. He was known to be wonderfully good at rats, and might, doubtless, had he chosen to turn his mind to honest pursuits, have

become a respectable and valued member of society. House-dwellings, however, were not to his taste. Where he stowed himself all day nobody knew, but as certain as sunset he might be seen prowling on ridges and roofs seeking something to devour. He generally found it. Sometimes it was a prime chick from the hen-roost, sometimes it was a couple of tender "squeakers" from a dormer, sometimes it was a little rabbit; very often it was a little rabbit—the property of my correspondent.

How the larceny was effected it was hard to tell. Every hutch was furnished with a big wooden button, and every button properly secured at night; but sure as ever one of the rabbits littered, the door of that hutch was found ajar in the morning, and at least one of the little ones gone. The mystery was inexplicable to my young friend, and one night he kept watch. The first night all remained secure; the second night passed with the same result: but on the third night, from the window, the watcher saw stealing up the pathway the grim grey cat. It approached the row of hutches, and going straight to that where the young ones were lodged, sprung on to the stand, and by a succession of rapid pats of its strong paw upon the button that fastened the door, it swung open, the grim grey cat walked in, and in a moment jumped out again with a little rabbit in her jaws, and off and away before the watcher could believe his senses. There could be no mistake, however; there was the swinging hutch-door, and there was the cat with her booty cantering over the tiles.

Revenge! Had it been an ordinary case—say of a cat making a snatch at an unprotected pet, and carrying it away—the hurling of half a brick might, if it hit him, sufficiently punish the delinquent; but here was a strategetic cat, who knew how to force doors—a sort of feline Jack Sheppard; it was worth while going a little out of one's way to concoct a fitting retribution for so renowned a rascal. My youthful correspondent's powers of invention were equal to the occasion. A neighbour of his father possessed a delightfully savage bull-terrier, a dog with considerably more bite than bark in him, and wonderfully sure of jaw. Moreover, his antipathy to cats was one of his chief characteristics.

As twilight of the following day approached, the remainder of the litter was removed from the hutch, and the bull-terrier installed in their place, while the concoctor of this diabolical

scheme, with a select party of friends, all more or less grudge-owers to the grim grey cat, posted themselves at the windows. By-and-by, when all was dark and quiet, and snug, a cat-like form was seen looming on the ridge of a distant washhouse. Stealthily it approached; it was the grim grey cat! Without a moment's delay it approaches the terrible trap; as before, it leaps on the stand and is presently patting the button round. The door swings ajar, and simultaneously with the swing, a sharp thrilling cry rends the air, the savage bull-terrier has pinned the unfortunate grim grey cat by the throat; his wicked career is at an end,—he is a dead cat.

But it is not always "the cat" that robs people's rabbit-hutches. The Rev. Mr. Wood, when a boy, kept some rabbits in an unused stable, and from time to time the said rabbits vanished mysteriously. "We had been told," says he, "that cats were the delinquents—a very reasonable suggestion, as the stable stood in a garden where cats swarmed at night, and we therefore determined to take summary vengeance on the first cat that entered the stable. We had been lately reading an account of the first French Revolution, and had been greatly impressed with the description of the guillotine. A self-acting guillotine was consequently determined on as the best method of punishing the thief. So we carefully closed every entrance to the stable, merely leaving a hole in the window-shutter about six inches square. Above this we suspended a bill-hook, to the back of which was attached a brick and some pieces of iron, the bill being retained in its place by a slender stick that crossed the aperture. When the stick was moved the bill-hook descended with great force, forming an arc of a circle passing over the square aperture. On the whole, it was not a bad piece of workmanship for three children, the eldest being ten years of age. The trap was accordingly set, and we retired for the night in great expectation of discovering next morning a decapitated cat outside the window and a detruncated head within.

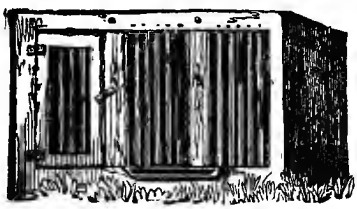
"Morning came, and we remained long in anxious expectation of the permission to rise. This given, we scampered off as fast as possible to the stable, where we found the trap down, several spots of blood, but no cat. On entering the stable, appearances were more mysterious, for the bill-hook was covered with blood and a considerable amount of blood had run down the wall, but still no cat. However, the rabbits were all safe, and the cats never stole any more. The only circumstance

that seemed to explain the mystery was that a lad who had taken some pains about our rabbits, and who used to advise us as to the best method of fastening the stable at night, wore his arm in a sling for several weeks afterwards."

Instances are not wanting to prove that the tame as well as the wild rabbit will sometimes exhibit considerable courage. The following paragraph, taken from a recent number of the *Times*, is no bad illustration of this:—

"A few evenings ago, Mr. Parfrey, of Clutton, who is an amateur breeder of rabbits, heard an unusual noise, and, on going to the spot whence the sound proceeded, saw a desperate battle fought in the rabbit-hutch, between one of his rabbits and a large-sized rat. He watched the combatants for a few moments with great interest, and saw the rabbit catch hold of the rat by the back of its neck, turn it upside down, and then with its forepaws rip up its antagonist, and nearly sever its head from the body. The rabbit, however, did not escape with a whole skin, for, after the fight, it was discovered that it had received several bites about the breast and head, but not of a severe character. The rat was one of the largest barn rats ever seen in the neighbourhood. The rabbit was a fully-grown one, with young ones."

TOP OF RABBIT-PIT.



THE OLD-FASHIONED RABBIT-HUTCH.

CONCERNING RABBIT HUTCHES.

It is quite time that some one ventured to champion the cause of this much maligned and unjustly contemned little animal. "Unjustly contemned!" I think I hear some youthful reader exclaim. "Not at all. We have tried it, and can state, without fear of contradiction, that rabbit-keeping can never be made either a profitable business or an agreeable pastime, and that the only return for your industry and capital is disgust and disappointment. We built a most comfortable hutch, and furnished it after the approved fashion. We stocked it with sound, lively animals, and fed them with all their hearts could desire. What was the result? The bucks grew gaunt and ragged, and fought and mauled each other like tigers; while the does either turned cannibals and devoured their children as fast as they were born, or else starved the majority of them through sheer indolence. They ate like wolves, and as to the house they lived in, it was an offence to the nose to approach it."

Alas! a pity it is that an animal of this abused species—some experienced, motherly old doe, for instance—could not for a little time be endowed with reason and speech, that she might remonstrate with her prejudiced keeper, and show him the *other* side of the picture. "Anybody," says Cobbett, "knows how to knock up a rabbit-hutch;" and who shall tell

the misery this doctrine has brought on rabbitkind? No one but the endurers of the misery. Oh! how the above-mentioned matronly doe, who through her long life had reared great troops of sons and daughters in the wretchedest of houses—some old tea-chest, or abandoned portmanteau, or leaky tub—how she would astound many a rabbit-keeping boy by a recital of her wrongs! How, if she were an eloquent doe, she would overwhelm him with shame and remorse by the narrative of her life-long troubles! I think I hear her: "My dear young master, blame not me that I am lean or that my little ones are few in number and pot-bellied. The fault lies with yourself. Doubtless you consider mine a very comfortable abode, but then you are a strong robust boy, and incapable of taking a rabbit's-eye view of the case. Comfortable! Why, my house is wretched. How would you like to live in such an one? How would you like to sleep in an apartment through the chinks of the walls of which the wind came whistling through with force enough to turn the sails of a windmill, and through the roof of which, in wet weather, the rain came drip, drip, patter, patter, spoiling the snug bed you had made for your helpless little family, and wetting their naked little bodies, and giving them snuffles in such a shocking way that it goes to one's heart to hear their troubled breathing? How would you like to be pent up, as many of us are, in a damp wash-house, shivering with cold during six days, and parboiled and steamed on the seventh, that is, on washing-day? How would you like to be condemned to perpetual imprisonment in a dark, draughty, ill-drained den, with no ventilation, and about the same amount of drainage? All these things I am compelled to endure, and at the same time expected to be jolly and grow fat, to be the most fruitful of mothers, and the most unexceptionable of nurses. It can't be done, my master. It can no more be accomplished than you yourself could be sleek and jolly, living in a tool-shed, and subsisting entirely on green stuff."

Nothing can be more fallacious than the doctrine that everybody knows how to knock up a rabbit-hutch. It simply means that any sort of box with four sides and a roof and a floor, is good enough for a rabbit to live in. This, however, is so contrary to common sense, to say nothing of common humanity, that it is past argument. "Anything" will not do for a rabbit-house, and a rabbit will no more thrive in a crazy, ugly box, than a canary would sing if housed in an old hat, or im-

mured within the narrow walls of a mouse-trap. There can be little doubt that the erroneous notion arises from the fact of the rabbit being naturally a burrowing animal, and perhaps it is excusable that ignorance should conclude that any sort of wooden structure is more comfortable than a hole in the damp earth. Very little inquiry into the matter will show that a rabbit burrow is considerably more than "a hole in the ground." The principles of rabbit architecture are of no mean order. As says a recent writer on the subject—

"To learn these, we must go to the warren. There we find that the rabbit makes its dwellings in a sandy soil, and therefore well drained; in hillocks and mounds, in preference to hollow bottoms, and therefore dry. The burrows frequently communicate with each other, and therefore allow a certain amount of ventilation, the wind blowing into the mouth of the hole being often sufficient to insure that. The thick stratum of light earth which covers the habitations of a colony of rabbits causes coolness in summer and warmth in winter. In the depth of a burrow it never freezes, and is never oppressively hot. In short, with the exception of the absence of light, which is of little importance in a *sleeping-place*, a rabbit's burrow, magnified to corresponding proportions, would make, at a pinch, a very bearable dwelling for human beings devoid of other shelter; the nest which a doe prepares for her young is soft and warm enough for a baby to lie in, if sufficiently enlarged. And, in truth, many thousands of our fellow-creatures spend their lives, are born, and die, in cellars which are less wholesome than a rabbit's burrow on this large imaginary scale would be."

We now come to the familiar "hutch." Every young rabbit-keeper should bear in mind that his stock will be exactly what he makes them. Domestication has the same effect on brute kind as civilization has on human kind. The ancient British savage, from whom sprang the nineteenth century British "swell," lived in a cave, was by no means particular whether his steak or chop was raw or cooked, and thought himself amply clothed in a coat of red and blue paint. This is a fact to be thought of whenever the rabbit-keeper finds himself wearying of the task of hutch-tending, and sliding back to the old delusion that so to fuss about an animal whose natural dwelling is a hole in the cold ground is something like housing a donkey in a drawing-room. Without doubt the rabbit's natural dwelling is a hole in the ground; but, then, recollect it

is in a *natural* condition. It is to "the manner born," and prefers its snug, gloomy, comfortable burrow to the most splendid prison you may contrive for him. If you insist on his compulsory companionship, and put him in a prison (hutch, you call it) with barred doors, that you may work your will with him, however absurd and fantastic that will may be—till his comfortable and decent russet suit assumes tints and colours unheard of in rabbitdom, till his ears grow inches longer than nature designed, and his lithe spine becomes crooked, or "fashionably arched;"—if you practise thus on his helpless carcase, and on the carcases of his descendants through many generations, till the result is no more like a wild free-living rabbit, than if it were of a totally different species, it is rather unjust to think hardly of the poor creature because it cannot content itself in a box, possessing all the disadvantages of cold and damp, and none of the advantages of ventilation, drainage, and pure air to be found in its native warren.

Let your first care, therefore, be to provide comfortable lodging for your rabbits. After all, the trouble and expense will really exceed by very little what it would cost you to build a make-shift residence, and once accomplished, you may depend that you have saved yourself an amount of future vexation and disgust, worth ten times the extra expenditure. How many rabbits do you intend keeping? If the number is not to exceed half a dozen, then, before all others, the "portable hutch" is to be recommended. It possesses many advantages, not least among which are the following: it is not the least unsightly—it may, indeed, be made rather a pretty object than an eyesore; it may be kept clean with as little difficulty as a bird-cage or a dog-kennel; its inmates may most easily be rendered secure from the attacks of cats and rats; and its site may be accommodated to shade or sun as occasion may require; and last, doubtless to the minds of most boy rabbit-keepers, it may be built easily by the perspective rabbit-owner, provided he has or can borrow a few carpenter's tools, and a moderate stock of that which, unfortunately, must be a natural possession and cannot be borrowed—patience, and a few planks. As I dissent from Mr. Cobbett's opinion that "any one can knock up a rabbit hutch," I will describe how the portable hutch should be constructed.

In shape it should be straight, sided and backed and floored, with a roof slanting equally on either side. The shape is presented by the common dog-kennel, or more familiar, the gene-

rally accepted form of Noah's ark. From front to back it should measure six feet, from side to side three feet six inches, and from roof to floor twenty-six inches—measuring from the commencement of the slope, and not at its apex. Your roof should, if possible, contain but two pieces, as you will then have a better chance of rendering it waterproof than if it is in four or more pieces. The slanting roof-pieces should eave beyond the upright walls of your house. Thus you have your "carcase," as housebuilders say. Now for the interior. Down the centre must be erected a light partition, rising to within four inches of the ridge of the roof, and falling short of the entire length of the hutch to the extent of a foot at either end. Next fix across the middle of your house another partition, or rather two partitions, one on either side of your first divisional piece. Thus you have four chambers to your house, but at present they are open at the ends, and must be walled in by means of two other partitions stretching across and fixed at either side to the edge of the long centre partition. Thus you get in addition to your four rooms the two commodious end compartments which will serve admirably for weaning purposes.

I may assume that your roof, for obvious reasons, although "roughed out," is not yet fixed. It will be seen that at present we have six rooms mightily snug, but furnished with no means of egress or ingress. The chamber doors must be in the *roof* of your house. This is, I am aware, at variance with ordinary notions of architecture, but will be found better than any other arrangement for your four-footed tenants; they may be more easily lifted through a roof door than through a wall door; they may be more easily supplied with food and bedding, and the ventilation of the compartments may, if proper care be taken, be secured. There should be as many doors or slides in the roof as there are rooms below. They must not be hinged like a box-lid, but made to slide in grooves, after the same fashion, to use a homely comparison, as the door that guards the vent of an ordinary dust-bin. I have seen these slides of glass, but it is not advisable to use that material. In the first place, rabbits are not partial to overmuch light, and, in the second, a cat mounting the roof of your rabbit-house, although she would be unable to get at the inmates, would probably indulge in such awful grimaces as to send a weak-minded doe into fits, or at least lead her to devour her little ones as fast as she could, if only to put them out of reach of the threatened danger.

Near the top of the wall of each compartment holes large enough to admit the tip of the little finger, and inclining towards the roof, may be bored. Six to the foot will not be too close for these air-holes. Be sure that the lappets of the grooves of your roof-doors are wide enough, and that the slides work so exactly in them that rain will not find its way through.

The *floor* of your rabbit-house is a very important consideration. It should be of beech, or some other equally hard wood. On this will greatly depend whether your rabbit-house is to be a standing nuisance, and a reason for grasping the nose whenever one approaches it, or whether it shall be as inodorous and sweet as a corn-bin. Provided your rabbits are well and properly fed, their evacuations will be chiefly of a dry character, but not entirely, and, though insignificant in quantity, their liquid waste is evil smelling, and pungent in the extreme. Therefore, if the floor of the hutch be of soft wood, it will in a very short time be impregnated with a disgusting effluvia, which it will retain in spite of all the scrubbing and scraping you may give it. The hard wood floor should be slightly tilted from front to back, and close along the back some small holes should be bored. If this precaution is taken, you will hear no complaints about "that nasty-smelling rabbit-hutch."

All that I have to add respecting the construction of the portable hutch is, that it should stand on four legs, a foot high, and that there should be at either end an ordinary stout iron box-handle, so that it may be easily lifted about by two persons. By-the-bye, there is one thing else, and of importance too: take care that the edges of the food-troughs be bound with tin, otherwise, especially if the rabbit is kept short of dry food, he will bite it into splinters and devour it piecemeal.

Where a considerable number of rabbits are kept, the portable hutch will not be sufficiently commodious. In such cases, the ordinary square hutches are generally placed one above another to the height required by the number of rabbits and the extent of the room. Where a large stock is kept, to make the most of room, the hutches may be placed in rows, with a sufficient interval between for feeding and cleaning, instead of being, in the usual way, joined to the wall. It is preferable to rest the hutches upon stands, about a foot above the ground, for the convenience of cleaning under them. Each of the hutches intended for breeding should have two rooms—a feeding and a bed room. Those are single for the use of the weaned rabbits, or for the bucks, which are always kept sepa-

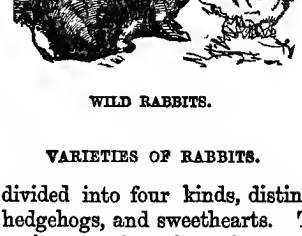
rate. The floors should be planed smooth, that wet may run off, and a common hoe, with a short handle, and a short broom, are most convenient implements for cleaning these houses. Ever bear in mind, that exposure to rain, whether externally or internally, is fatal to rabbits, which, like sheep, are liable to the rot, springing from the same causes. Thorough ventilation and good air are indispensable where many rabbits are kept, or they will neither prosper nor remain healthy for any length of time. A thorough draught or passage for the air is, therefore, absolutely necessary, and should be so contrived as to be checked in cold or wet weather by the closing or shutting of opposite doors or windows.

A cheaper hutch for a less number of rabbits may be constructed according to the directions of the author of "British Husbandry." The breeding-hutch, as being the lodging of the doe, is always the larger, and contains a double apartment—one for the nest, and the other for the feeding-room of the brood when old enough to come into it. The best size is about four feet long by two and a half wide, and eighteen inches to two feet high; but they are often made smaller, and those not meant for breeding are seldom more than two-thirds that size. They are latticed with wire in the front of each, as, if made of laths, the rabbits would gnaw them; but the division parted off for the reception of the breeding-nest is closed both at the front and sides, leaving only a small door in the interior for the entrance of the doe: indeed, an inner division, with a sliding-door, is useful for confining the rabbits while the outer part is cleaned. There should also be a moveable feeding-trough, which should be regularly taken away after every meal; for rabbits, like horses, if allowed to blow upon their food, will not afterwards eat it, unless pressed by serious hunger. The troughs should be made of tin or iron, to allow of their being easily cleaned; and should have separate compartments of not more than four inches long, both for different sorts of food as well as to prevent the rabbits from getting their feet into the trough and throwing out the corn. Some persons even add a small sack at one end of the hutch for the purpose of containing the hay on which they feed; but the small quantity usually given is more commonly left upon the floor. The trough should either be inserted as a drawer, or, if placed outside the hutch, should be covered by a hinged flap, to shut and open in either the front or one end. The floor is commonly pierced with holes to allow the escape of urine; but, as the greatest atten-

tion is necessary to be observed in the cleansing, it is a good plan to have a false bottom which may be drawn out, like that of a bird-cage, for the removal of the excrements, and ought to be every morning scraped and strewed, with a little sand, or in cold weather covered slightly with refuse hay; for rabbits will never thrive unless kept dry and clean.

To these directions for hutch building may properly be added the following hint provided by Mr. Delamer:—

"Breeding does, when kept in hutches, are much better each in a hutch to herself, than inhabiting one common dwelling, however roomy it may be. When a number of does live in the same hutch, the consequences are sometimes quite as unfortunate as if the buck were in company with them. If a doe kindles, and leaves her little ones a moment to feed, the other does immediately crowd round the nest through an instinct of curiosity, peep into it, and not seldom disturb it with their fore-paws. The mother rushes up to drive the other does away; a battle ensues; and half the little rabbits are either killed or wounded for life. The pregnant does which take part in these skirmishes, generally suffer abortion in consequence of their excitement, and the blows which they give and receive in the combat. Their owner may read the Riot Act afterwards, but the mischief is done."



WILD RABBITS.

VARIETIES OF RABBITS.

Rabbits are divided into four kinds, distinguished as warreners, parkers, hedgehogs, and sweethearts. The warrener, as his name implies, is a member of a subterranean community, and is less effeminate than his kindred who dwell *upon* the earth and have "the world at their will," and his fur is the most esteemed. After him comes the parker, whose favourite resort is a gentleman's pleasure-ground, where he usually

breeds in great numbers, and from which he frequently drives away the hares. The hedgehog is a sort of vagabond rabbit, that, tinker-like, roams about the country, and would have a much better coat on his back if he was more settled in his habits, and remained more at home. The sweetheart is a tame rabbit, with its fur so sleek, soft, and silky that it is also used to some extent in the important branch of hat-making.

Another variety of the rabbit family, known as the "silver-sprigged," has lately been introduced into this country, and may be reckoned—commercially speaking—among the most valuable. Its colour is a black ground, thickly interspersed with grey hairs.

There is a very large species of the hare-colour, having much bone, length, and depth of carcase, large and long ears, with full eyes, resembling those of the hare; it might be taken for a hybrid or mule. Its flesh is high-coloured, substantial, and more savoury than that of the common rabbit; and, cooked like the hare, it makes a good dish. The large white, and yellow and white species, have whiter and more delicate flesh, and, cooked in the same way, will rival the turkey.

Those above-mentioned, however, are but the plebeians of rabbitdom. They may be fat and sturdy, but as the worthy secretary of a rabbit club informed the author of "Farming for Ladies," *brute weight* formed no consideration with the club. The first "point" looked to by the fancier is the "fancy" animal's ears. Sometimes, instead of drooping down, they slope backwards: a rabbit with this characteristic is scarcely admitted into a fancy lot, and is not considered worth more than the common variety. The next position is when one ear lops outwards, and the other stands erect; rabbits of this kind possess but little value, however fine the shape and beautiful the colour, although they sometimes breed as good specimens as finer ones.

The forward or horn-lop is one degree nearer perfection than the half-lop; the ears, in this case, slope forward and down over the forehead. Rabbits with this peculiarity are often perfect in other respects, with the exception of the droop of the ears, and often become the parents of perfect young ones; does of this kind often have the power of lifting an ear erect. In the oar-lop, the ears spread out in an horizontal position, like the wings of a bird in flight, or the arms of a man swimming. A great many excellent does have this characteristic, and some of the best-bred bucks in the fancy are

entirely so. Sometimes a rabbit drops one ear completely, but raises the other so nearly horizontally as to constitute an oar-lop; this is superior to all others, except the perfect fall, which is so rarely to be met with, that those which are merely oar-lopped are considered as valuable rabbits, if well bred and with other good qualities.

The real lop has ears that hang down by the side of the cheek, slanting somewhat outward in their descent, with the open part of the ear inward, and sometimes either backwards or forwards instead of perpendicular; when the animals stand in an easy position, the tips of the ears touch the ground. The hollows of the ears, in a fancy rabbit of a first-rate kind, should be turned so completely backwards that only the outer part of them should remain in front; they should match exactly in their descent, and should slant outwards as little as possible.

LOP-EARED RABBIT.

Perfect lops are so rare that a breeder possessing twenty of the handsomest and most perfect does would consider himself lucky if, in the course of a year, he managed to raise twelve full-lopped rabbits out of them all.

The "dewlop" is a consideration of vast importance with rabbit-fanciers. This is, as the reader is doubtlessly aware, a bulky sort of appendage pendant beneath the chin. The thicker the dewlop grows the more is it admired; indeed, when the animal is lying on all fours, asleep, it should support her head like a cushion. The dewlop does not attain its full size till some time after the animal has otherwise ceased to grow.

Colour is another important feature. As regards variety and purity of colour, an experienced breeder says:—

"The fur of fancy-rabbits may be blue, or rather lead-colour, and white, or black and white, or tawny and white, that is, tortoiseshell-coloured. But it is not of so much importance

what colours the coat of a rabbit displays as it is that those colours shall be arranged in a particular manner, forming imaginary figures or fancied resemblances to certain objects; hence the peculiarities of their markings have been denoted by distinctive designations. What is termed 'the blue butterfly smut' was, for some time, considered the most valuable of fancy rabbits. It is thus named on account of having bluish or lead-coloured spots on either side of the nose, having some resemblance to the spread-wings of a butterfly, what may be termed the groundwork of the rabbit's face being white. A black and white rabbit may also have the face marked in a similar manner, constituting a 'black butterfly smut.'

"But a good fancy rabbit must likewise have other marks, without which it cannot be considered a perfect model of its kind. There should be a black or blue patch on its back, called the saddle; the tail must be of the same colour with the back and snout, while the legs should be all white; and there ought to be dark stripes on both sides of the body in front, passing backwards to meet the saddle and uniting on the top of the shoulders at the part called the withers in a horse. These stripes form what is termed the 'chain,' having somewhat the appearance of a chain or collar hanging round the neck.

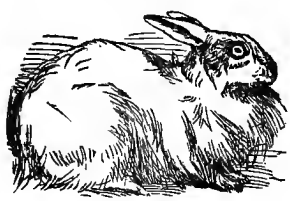
"Among thoroughbred fancy rabbits, perhaps not one in a hundred will have all these markings clearly and exactly displayed on the coat; but the more nearly the figures on the coat of a rabbit approach to the pattern described, the greater will be its value, so far at least as relates to colour. The beauty and consequent worth of a fancy rabbit, however, depends a good deal on its shape, or what is styled its carriage. A rabbit is said to have a good carriage when its back is finely arched, rising full two inches above the top of its head, which must be held so low as for the muzzle and the points of the ears to reach almost to the ground."

Fancy rabbits fetch a very high price; so much as five and ten guineas, and even more, is sometimes given for a first-rate doe. If young ones are first procured from a good family, the foundation of an excellent stock can be procured for a much smaller sum.

Compare a thoroughbred "fancy" rabbit, say a true "lop," with the neat little "hedgehog" or "warrener," and it is really very hard to believe that any amount of cultivation could bring about a change so radical. It is denied by some naturalists that the two races are identical, and any one who has endea-

voured to bring up from the nest a litter of wild rabbits must be inclined to the same opinion. "Fancy rabbits," says Mr. Rogers, in his treatise, "are not, as is generally supposed, the result of an improvement (?) in the English breed of rabbits, but were originally brought from Tartary, Persia, and Asia Minor, and have been made the means of improving the domestic breeds in this country. They require more warmth than the common English domestic rabbit, and thrive best in an atmosphere the warmth of which varies from temperate to summer-heat. The common domestic rabbit will do in colder and more exposed situations, but the fancy rabbit degenerates unless carefully attended and kept from cold and wet."

Without, however, declaring that Mr. Rogers is wrong, as unceremoniously as he asserts that he is right, it must be admitted that his argument cannot be accepted without question. Even more flagrant instances of the utter perversion of an animal's shape and fur, nay, of its very nature, may be quoted against the case of the rabbit. Look at the dog. Compare the Blenheim spaniel with the bloodhound, or the Skye terrier with the bulldog. Whatever diversity of opinion may exist respecting the dog's origin, nobody entertains the notion that the animal is derived from more than one source. A certain



ANGORA RABBIT.

animal, whatever its name, wolf, fox, or jackal, is without doubt the founder of the dog tribe, with its more than fifty different shapes and habits, and this allowed, one need not damagingly strain one's imagination in tracing even the long-haired Angora rabbit back to the humble warrener. Nature is wonderfully elastic. The arctic bear, imported to a warmer climate, loses the snowy whiteness that, assimilating with all its surroundings, at once secured to it its prey and saved it frequently from the hands of the hunter; the kangaroo confined in a cage, and having no further need for its wonderful pouch

as a refuge for its young, that appendage grows gradually less capacious, while from almost incessantly mounting on its tall springy hind legs, the better to look out for enemies and be ready for instant flight, it descends to all fours like the most ordinary quadruped.

HOW TO STOCK THE HUTCHES.

THERE are two modes of setting up as a rabbit-keeper; one by procuring a full-grown buck and three or four does, and the other by purchasing ten or a dozen young rabbits, say from eight to ten weeks old, and through them founding a stock. There is a third mode, purchasing a doe ready or nearly ready for kindling. Assuming, however, that I am addressing amateurs, I will simply say in reference to this system, don't adopt it. No animal is more whimsical than the rabbit. It may breed well when used to its residence and the sight of its residence, but should a change occur nothing is more likely than that she will, if near littering at the time, cast her young prematurely, or waiting till they are born, either eat them up or refuse to afford them any attention. Either of these misfortunes may happen where the animal has a fair chance of doing well, where it is left undisturbed and only visited to be fed and have its house cleaned up; but how many boy-purchasers of such a doe would be content with so tame a proceeding? The impatience which prompted the purchase will surely manifest itself none the less now that the longed-for treasure is obtained. He will ever be taking "just a peep," and in his solicitude for the doe's comfort, make and unmake her bed a dozen times a day; a mistaken kindness, enough to drive an experienced doe clean out of her senses in a very short time.

Besides this, let your intentions be ever so good, you may, by such a purchase, be led to disappointment and regret through the dishonesty of a dealer. You may be offered a doe handsome looking, and certainly to all appearance well worth the moderate price asked; at the same time, in the vendor's eyes, she may be "dear at a gift," as the saying is, through some affliction she possesses, but which does not at present manifest itself, and which may render it equally unfit to live or die.

The plan of keeping a buck and several does has its objectionable features. In the first place they are costly, and in the second, they are animals that know "what life is," and may

suffer by coming into your inexperienced hands. It would be better, if adult rabbits are purchased, to have only does. True, if you mean cultivating a stock, a buck will be indispensable; but he is a fellow who may always be induced to look in and see how your does are getting on by making a trifling present to his master. This plan will be found cheaper and much less troublesome. Bucks are always quarrelsome fellows, have enormous appetites, and after all, supposing you to keep no more than half a dozen does, will be useful but a very few times in the course of a year.

Without doubt the best plan the beginner can adopt is to procure eight or ten healthy rabbits as soon as they are fairly weaned. They will not cost more—unless they be of a fancy sort—than sixpence each; and that will be the only loss should one die,—as probably it will; more, perhaps. Any how, by the time they have reached the breeding age of six months you must indeed have been very unlucky, or very imprudent, if there is not still remaining a tolerable number of sturdy young rabbits, and with whose habits and peculiarities you are by this time well acquainted. Let them remain till your prospect of three or four litters is put beyond a doubt, and then make your selection, turning over the discarded ones either to the cook or the dealer.

If you purchase adult animals, take care that the doe has a broad chest, that her legs are wide apart and sturdy, that her ears are wide and long, and have a fine silky feel when passed between the fingers, that her head is wedge-shaped, and that her teats are well developed and of a pinky hue. As for the buck, the first essential is, that he be bright-eyed and quick in his movements. Pass your hand over his limbs: if his knees and other joints feel hard and "knobby" it is a bad sign; if his belly has a paunchy appearance, and his nails are long and thick, you will find it a good plan to decline his further acquaintance. His symptoms declare him to be too old to breed, and if you kill him for the pot or spit, you will find it a sheer waste of stuffing, he will be so tough.

As already mentioned, at six months the doe is old enough for breeding, and on no account should you allow her to begin earlier. True she will have young, if allowed, by the time she is five months old, and they may be healthy and numerous enough; the next litter, too, may turn out tolerably satisfactory; but ever afterwards you may depend on her presenting you with a miserable lot of pigmies you will be ashamed to see.

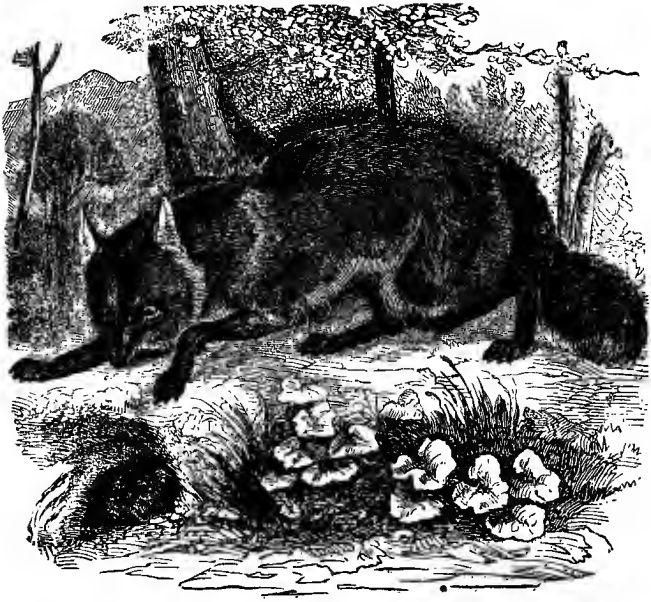
They will be lank and scraggy, and consequently as voracious as so many young wolves, while the poor mother will be scant of milk and altogether unable to meet their increasing demands. Thirty or thirty-one days is the period of the does going with young. The buck should be allowed to visit her a fortnight after she has littered—never within a less time. Be as particular as regards this as with the time at which you allow her to commence breeding, or the consequences may be equally disastrous.

It is a common thing with folks whose business with rabbits is bounded by describing their habits in utterly impracticable books, to assert that the animal in question will have eight litters within the year. So she may, supposing her to enjoy the most perfect health, and supposing her never to be frightened by a stray cat or a sudden gun-shot, or the violent slamming of a door, and supposing that her food invariably agrees with her, and supposing at least twenty other doubtful circumstances, so she may; but the chances are that she will not litter satisfactorily more than six times a year. Even five times will yield you a round number of young ones in twelve months; for if she be a compact little doe (always bear in mind that as a rule *little* rabbits have more young at a litter than *big* ones), she will fairly average ten at a litter, and there you have a grand total of fifty. The fruitfulness of this animal has been the subject of wonder to all naturalists. In a wild state it breeds seven times in the year, and generally begets seven or eight young ones at a time. If we suppose this to happen regularly for a period of four years, the progeny that would spring from a single pair would amount to more than a million. As the rabbit, however, has many enemies, it never can be permitted to increase in numbers to such an extent as to prove injurious to mankind; for it not only furnishes man with an article of food, but is, by carnivorous animals of every description, mercilessly sacrificed. Notwithstanding this, however, in the time of the Roman power, they once infested the Balearic Islands to such an extent, that the inhabitants were obliged to implore the assistance of a military force from Augustus to exterminate them.

To return to our doe. After a night's absence from her fortnight-old youngsters, she should be returned to them and allowed to suckle them a week or ten days longer. By observing these rules, as well as the others laid down in this volume, your doe will breed summer and winter, and deserve

the character of a tender and devoted parent. If within three or four weeks of the visit from the buck something should unluckily happen to blight your prospects of a litter, nutritious and stimulating food should be given to the doe—parsley, fennel, thyme, &c., with unlimited supply of oats, pollard, and fresh hay; in a few days she will be again well enough to receive company.

Assuming that you know to within a day or so when the "little strangers" will arrive, you will, a few days before the auspicious event, provide the doe with a good handful of sweet hay. Never fear that she will not know what to do with it. If you peep in in the course of a day or so you will find that she has constructed a snug bed; the outside being of the hay with which you provided her, and the inside of the delicate down of her breast and belly, and of which she has generously stripped herself that her babies may not lie cold. By the bye, I should have remarked that before you provide her with materials for bedding, you should clean her hutch out thoroughly, because you will not be able to do her this kind office again for a considerable time. Even after her bed is made she will be much vexed at any disturbance, and of course after the young are born to meddle with them is out of the question. Of course there will occur cases in which their removal at once is the only chance of saving their lives. If the hutch were swamped in a thunder-storm, for instance. Then you must move them not one at a time, but taking their whole numbers together with the nest in your two hands, having taken care to provide a snug berth for their reception. Even if there should happen to be a very damp corner in the hutch, and the doe should select it as her bedding-place, you will be justified in moving it. Says Mr. Delamer, "One little act of disturbance may be ventured upon with due precaution. A few days after the birth of the rabbits, it will be advisable to ascertain whether their mother has deposited them in a dry spot; for if their nest is at all damp, they will infallibly perish. In such a case, the nest must be cautiously moved, in a lump, and shifted to the driest corner of the hutch. Experience has proved that this operation, if judiciously executed, caused no injury whatever to the young, and also gave no offence to the mother; but, after all, the expedient must be used with caution. The inconvenience which compels the rabbit-keeper to have recourse to it ought to be avoided by cleaning the hutches at regular periods, so that there shall be no necessity to intrude upon the



FOX AND RABBIT.

privacy of the doe's nursery at the time when she is likely to be of a susceptible and jealous disposition. For this purpose it is requisite to note accurately the date of the doe's visits to the buck, in order to be able to change the litter in good time, and also to remove a first set of young ones when there is a prospect of their soon being followed by a second."

It will sometimes happen that a doe will bring forth a larger number of young ones than she can maintain; in this case she will probably kill what she considers the superfluous ones. You should endeavour to meet this. Unless the doe is very strong and in perfect health, more than eight sucklings will impoverish her, and she may have as many as fourteen. In such a case you may as well destroy the extra ones yourself and profit by the advantage of selection, as leave it for her to do. Not that she will invariably kill the strong ones and retain the weak. In the promulgation of Nature's laws anything so weak as what is commonly known as "sentiment" cannot possibly be tolerated. It is not in the scheme of Nature that weak and puny creatures should come into the world, and where such an

event happens we may depend that the Great Mother has been wantonly or designedly thwarted in her designs. We have abundant evidence of this, but more especially in the dog. When, to suit the monstrous whims of "fanciers," canine creatures are encouraged in the production of fantastic abortions—wonderful either for dwarfishness, or baldness, or hairiness—the mother will invariably be inclined to neglect and refuse to maintain the most absolute specimen of ugliness in the litter. "The debilitated hope of particular litters," says Dr. Mayhew, "comes off but badly; it is pushed aside by its brothers and sisters, whose vigorous greediness seems to endear them to their mother. For the boisterous gluttons she will accommodate her position, and fondly lick them for their energetic appetites; but to the poor sickly thing she has given life to, she lends no assistance and bestows no attention. She seems to be ashamed of, and disgusted with, its degeneracy; and while the others grow fat and sleek from positive repletion, it becomes thin and dirty from actual starvation. Where it is desirable to rear the smallest of the litter, the mother must frequently be held, in order that the little thing may suck her."

A doe's first meal after kindling should consist of a gruel made of barley-meal and milk. According to no less an authority than Mr. Mowbray, should the doe exhibit extreme weakness after the litter has made its appearance, or happen to catch cold, "she will drink beer-caudle as well as any other lady," or warm fresh grains will comfort her, as will a mash, composed of scalded fine pollard or barley-meal, and in which is mixed a small quantity of cordial horse-ball.

Rabbits, it is well known, will occasionally so far seem to forget their nature as to devour their progeny, and this failing has been ascribed to various causes. It has been said that fright will so operate on the doe as to induce her to become a cannibal. One naturalist speculates on the probability of the animal's brain becoming deranged at the birth of her young ones, and that on the ground of insanity she is irresponsible for her acts. The most favourite and modern theory, however, is that the tiny creatures are devoured that the mother may assuage her raging thirst. Mr. Mayhew, the celebrated veterinary surgeon, gives the following evidence in support of this theory:—"A doe was sold to me very cheap, and was in litter at the time of purchase. A week after she came into my possession, she plucked her fur and made her bed. One morning I distinctly saw a nest full of young; but looking again at noon,

not a single one of the progeny was to be seen. Some little blood and a mangled leg told their history; and the animal a fortnight after was again put to the buck. I by chance discovered while the doe was breeding that she had an inordinate thirst. At first it amused me to see the creature lap the water I presented to her; but at last I placed within her hutch a cup, and had it constantly filled. Her desire for liquid was not easily quenched, and it became to me a source of some pain when I reflected how much agony the craving must have caused prior to my being conscious of its existence. The next litter, however, was not eaten by the mother. She brought them up, and they likewise did well, drinking as much as they pleased. The disposition of the doe appeared to undergo a complete change: from having been savage, that is, from always endeavouring to bite and scratch the hand that cleaned her residence, or even supplied her table, she became gentle and familiar, allowing herself to be caressed and her progeny to be inspected. She was at last as good as she was beautiful, and I parted with her for a sum exactly four times that which she had cost me."

Another instance is related of a doe rabbit who had a litter of seven young ones a week old. "It was high summer time, and the hutch stood in such a position that the noonday sun blazed full on the roof of it. The proprietor of the hutch and its contents happening to come into the garden, peeped in at a chink at the back of the hutch, and there saw the poor doe with her tongue protruding from her mouth hurrying to and fro, while her little ones lay huddled in a corner. Now she would pause and lick the iron lattice-work forming the door, and then look about her with a bewildered air as though painfully at a loss for something not in sight. The watcher noticed that instead of caressing and lying close to the little ones she seemed to get as far from them as possible. Presently, however, she turned suddenly round and eyed the corner where her babies were in a most ferocious manner, at the same time pawing the floor with her fore feet, as angry rabbits will. The animal's appearance—its rolling tongue and flashing eyes—all at once made it apparent to the rabbit-keeper that the poor creature was enduring the agony of thirst, and he at once hurried into the house and fetched a basin of water. When he again approached the hutch, however, he was horrified to see the doe in the very act of tearing one of her progeny to pieces. As soon, however, as the water was placed within her reach

she abandoned the mutilated carcase and lapped greedily at the basin till she had drained it dry. She then returned to her young, and, so far from renewing her sanguinary repast, commenced licking the little mangled body and expressing as plainly as a rabbit could her regret at what had taken place."

So far, then, it would seem that the true solution of the mystery has been discovered; but before the thirsty doctrine is entirely accepted, it would be as well to inquire why it is that other animals, having free access to drink, and as much of it as they can possibly require, occasionally devour their young? The propensity is common, not only among rats and mice and hedgehogs, but among dogs and cats, who are not so incommoded by the birth of young but that they can usually get about the house again in the course of a very few hours. As regards these animals, therefore, some other cause than thirst must exist. An authority of considerable repute says, "I have observed annoyance or ill health precede or accompany this act in animals. If the rabbit be looked at, alarm seems to change her nature; and the bitch that devours her pups will, upon inquiry, generally be found to have suffered some species of persecution. That the brain is affected there can be no doubt,—the unnatural propensity is of itself a proof; but the strange appearance and the altered looks of the creature sufficiently denote her state. She is not then savage—her ferocity has been gratified; and she seems rather to be afflicted with the remembrance of the act she was unable to resist. She is the picture of shame; she slinks away at our approach; her aspect is dejected, but I think more with sorrow than crime."

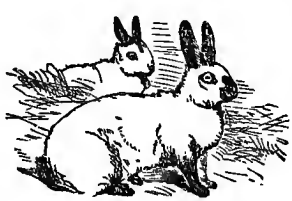
Besides the causes mentioned, hunger will induce a rabbit mother to eat her young. Taking the number of reliable cases here and there quoted, however, the majority are in favour of ascribing too eager meddling with her young as the chief cause of her cannibalism. A very curious instance of this occurs in a pleasing volume, "Anecdotes of Animal Life." The mother of a very young family was displeased at the curiosity evinced by several children respecting her little ones, who were very comfortably lying in the day-room. She therefore carried them off, one by one, into the bed-chamber, picking them up with her teeth. One unfortunate little creature was seized by one of its ears, and in the struggle between its parent and itself, the ear was fairly pulled off. The mother took the misfortune very philosophically: she ate the severed ear, and then seizing

her child by the ear that remained, dragged it into the bed-chamber with the rest.

However averse one may be to such a course, it is only fair to set against the modern theory that rabbits are cruelly used if denied drink, the arguments of a host of breeders on the old-fashioned system, who persist that water is injurious. Writing to me on the subject, a rabbit-breeder says, "That the rabbit *will* live and thrive without other liquid aliment than may be derived from green leaves, is a question that might be answered affirmatively by hundreds of rabbit-keepers, and if they were endowed with speech, by rabbits themselves, in a million cases. To my thinking there is no getting over the fact, that the rabbit by nature possesses the capability of existing almost entirely without drink. Domestication and culture may alter the form of the animal, or even his tastes and appetites, but that it could ever so completely revolutionize the laws of nature as to make a drinking animal a non-drinking one, is more than the maddest philosopher dare assert. Here is the case: the rabbit *eats*, and *does* do without drink. I have scores of animals of my own, and am acquainted with people who have each ten times my number, and never is such a thing as a water-vessel seen within my hutches or theirs. All the liquid they require they obtain from the green meats with which they are regularly provided. It is seldom I have sickness in my hutches. Of course I have, as has every other rabbit-keeper, a few does in my collection who are given occasionally to cannibalism; but surely it is too hard on the 'no water-trough' party to attribute the continuation of the horrible propensity to their old-fashioned system. All the world—at least, all the rabbit-keeping world—knows that anything that tends to fright or suspicion on the part of a doe, will induce her to devour her young. Will she not do so if a cat happens suddenly to look in on her and her progeny, or if the noise of a gun-shot startles her, or even—as once was my experience—should a mouse creep into the hutch? And may not all or either of these things occur, even if an entire water-works were at the animal's command? There is no denying that the practice of allowing rabbits to drink at their will has seeming humanity to back it, and I must say that if I found that my rabbits would thrive as well with as without water, they should have it; but as I only want to see the animals in my care healthy and thriving, and as to the best of my belief they are both, I have no present hydropathic intentions."

All things considered, however, there can be little doubt that the ancient maxim, that water given to rabbits will kill them, or at least afflict them with pot-belly as long as they live, is a delusion. Let them drink, but moderately. If however, despite this precaution, your doe continues to eat her children, get rid of her. Should a doe more than once or twice be guilty of the unaccountable carelessness of "over lying" and smothering her children, you had best get rid of her.

While the doe is suckling, take care that she is not only plentifully but also regularly fed; a postponement of her supper for two hours may check her milk, and cause the sucklings to suffer very materially. Six weeks is the longest period the little ones should be allowed the teat; after that they must be weaned. Turn them out of their mother's apartment, and provide them a warm and snug hutch to themselves. Feed them for a few days on two-thirds corn and hay and one-third sliced carrot or mangel-wurzel: this they will devour very readily. Beware of giving the weanlings *wet* greenstuff; a little of this sort of food is all very well, but that little should be perfectly dry. This is of the utmost importance; and there is little doubt that thousands of sucklings come to an untimely end through scouring from this cause. It will be as well to make a rule never to allow your rabbits to have green meat that has not been previously dried, either in the sunshine or before the fire. That is, of course, dried till all *surface* moisture has evaporated; if you bake the leaves till they are brown, you may as well give your rabbits a few wood shavings.



HIMALAYA RABBITS.

FEEDING.

THERE is a great diversity of opinion as to the best mode of feeding rabbits. Mr. Young thinks that carrots and parsley are what the rabbits are most fond of, but that oats and hay should always be given along with as much green food as they can possibly consume. By adopting this system, he declares that at the age of five or six months they may easily be brought to the weight of a full-sized hare—that is, to a weight of five or six pounds. Mowbray says, "I killed a buck which weighed three pounds, fit for the spit; it was put up in good case, and was only one month in feeding, consuming not quite four quarts of oats, with hay, cabbage, lucerne, and chicory."

It should be remembered "that the rabbit is naturally an animal of nocturnal, or we ought rather to say of crepuscular, that is, *twilight* habits. It is, therefore, an error to believe that it is requisite to give them a substantial meal at noon; on the contrary, nature and observation indicate that they ought to be left in quiet at that hour, when they are almost always in a state of repose, especially during summer. The best feeding times are very early indeed in the morning, and about sunset in the evening. They usually eat with the greatest appetite during the night."

The author of "British Husbandry" gives the following testimony relative to the expediency of feeding rabbits chiefly on oats:—"Having heard that a full-grown rabbit, of four or five months old, will eat a quart of oats in eight days, we resolved on trying the experiment. We therefore purchased a fine buck of that age, and had him fed entirely upon oats, with only a little green vegetables just to improve his appetite, and found that in six weeks he ate six quarts of good oats, weighing at least forty pounds to the bushel. He was then killed and dressed in the manner of a brown fricassee; but though of remarkably fine flavour, he only weighed, when trussed, three pounds two ounces. With regard to the *expense* of this sort of feeding: assuming that a rabbit is to be fed with both garden stuff and corn after being weaned, little more than half the above quantity of oats will be sufficient; and if continued at that rate for four months from his being weaned, the quantity of oats which he will consume will perhaps not exceed ten pounds, the cost of which, if bought at three-and-sixpence per

bushel, will only be a shilling and a penny; and as the garden-stuff will be merely refuse, the only additional expense will be a trifle for hay: so that the whole amount may probably be about one shilling and fourpence; and a well-fed rabbit will generally weigh from two to three pounds when trussed for the table, for which the poulterer will charge at least two shillings, besides keeping the skin, which, if in season—that is to say, in winter—is usually worth a few pence."

Turning from the author of "British Husbandry" to Mr. Cobbett, we find that renowned authority thus expressing himself on the subject:—

"*Abundant food* is the main thing; and what is there that a rabbit will *not eat?* I know of nothing *green* that they will not eat; and if hard pushed, they will eat bark, and even wood. A *variety* of food is a great thing; and, surely, the fields and gardens and hedges furnish this variety—all sorts of grasses, strawberry-leaves, and ivy. They should have oats once a day. When the doe has young ones, feed her most abundantly with all sorts of greens and herbage, and with carrots, and the other things mentioned before, besides giving her a few oats once a day. This is the way to have fine healthy young ones, which, if they come from the mother in good case, will very seldom die. But do not think that, because she is a small animal, a little feeding, or a little care, is sufficient. To those gentlemen who keep rabbits for the use of their family (and a very useful and convenient article they are), I would observe, that when they find their rabbits die, they may depend on it that ninety-nine times out of the hundred *starvation* is the malady. And particularly short feeding of the doe while and before she has young ones; that is to say, short feeding of her *at all times*; for, if she be poor, the young ones will be good for nothing. She will *live*, being poor, but she will not, and cannot, breed up fine young ones."

There can be no doubt that Cobbett is right when he says, that *variety* of food is of the utmost importance as affecting the rabbit's bill of fare. There is scarcely a green thing that grows that may not be given them at certain times and in moderation. Let it be borne in mind, that if rabbits be supplied with as much corn as they can eat, you need have no reluctance in giving them vegetables. The great harm is to give them green-meat as *victuals*, instead of as *medicine*. When I say corn, I mean dry corn: such as oats, peas, wheat, indian-corn, or buck-wheat—and not grains. To give a rabbit grains, as well as

green-meat, is to condemn him to certain scouring, and probably to death. Their green food should consist chiefly of carrots, turnips, artichokes, the stumps and ribs of cabbage, cooked potatoes (better baked than any other way), grass, strawberry-leaves, cow-parsley, and dandelion. Some folks seriously recommend wild parsnip or hog-weed for rabbits; but hear what Mr. Mowbray says on the subject:—

"On moving out of Middlesex to Hants, I took with me a favourite stock of rabbits in the highest condition. Being particularly engaged for the first fortnight I scarcely bestowed a look on my rabbits. When I saw them, instead of the well-fed, merry, gamesome creatures, as they formerly were, I beheld a parcel of moping, pot-bellied, and scouring creatures, which had lost all the fine solid flesh put upon them by former high-keeping. On demanding the cause of this unfavourable change, I discovered it to be in the quantity of hog-weed with which they had been daily supplied. This being discontinued, they soon recovered their pristine condition."

On the subject of feeding, a clever writer remarks, "Too much food at a time is as bad as too little. Twice a day is often enough to supply them with food, except in the case of breeding does, whose trough should be replenished just as often as she empties it. To a *breeding* doe of full size may be given in the morning a handful of sweet dry hay and half a pound of wholesome vegetables, at noon a pint of good oats should be put into her trough, and the last thing at night a piece of carrot or parsnip, and a handful of clover, or a cold baked potato and some beans. Grey peas may be given them occasionally instead of corn, and if the peas are old, soak them in cold water for a quarter of an hour. Tea-leaves and such kind of victual should scarcely be reckoned, serving, as they do, rather to amuse the animal than to stanch his hunger. I have heard it asserted that no food is more highly relished by the rabbit than brewery grains and tea-leaves, yet I have always found, when corn and these things have together been placed in his house, the rabbit, like a sensible fellow, no more deigned to notice the soft messes than an hungry Englishman would desert English beef for French kickshaws.

It would seem, then, that the advice concerning rabbit-feeding as given by both ancient and modern keepers may be summed up as follows.

There can be no doubt that a judicious supply of vegetable diet not only improves the health of rabbits, but also adds to

the juiciness of their flesh. Both extremes must be avoided. Rabbits fed largely on green-meat become flabby and soft-fleshed, while, on the other hand, those that are fed entirely on dry food—corn and hay—become unpalatable on account of the *closeness* and dryness of their flesh. Let corn be the standard diet and green-meat the corrective of this last-mentioned objectionable quality in rabbit meat.

DISEASES OF THE RABBIT AND HOW TO CURE THEM.

It is an wholesome maxim, and one that as well applies to four as to two-legged animals, that diseases are more easily avoided than cured. There is no such thing as running in debt with nature and shirking payment. So surely as seeds fructify in the earth will the seeds of disease planted in living creatures—whether wantonly, carelessly, or with brute obstinacy—grow up apace and flourish. If we can stave off the grim reaper, so much the better.

If I had as many guineas as there are rabbits brought to an untimely end in a single year through sheer neglect of their keepers, I should be as rich as a Jew—as rich as that golden Hebrew, Baron Rothschild. I'm sure I should be half as rich if I had but the hides of the sacrificed animals, and sold the sheared fleece to the hatters and to the bed-makers, and the skins to the makers of fine glue.

The disease called the "rot" is the rabbit's greatest enemy, and he who delights to feed his rabbits on decaying green stuff, is the best patron of the disease in question. You will know that your animals have this malady by their growing lean, and by unsightly sores appearing on them, especially on their noses and ears. If you set vigorously to work as soon as you observe these symptoms you may effect a cure. Feed them entirely on food of a dry and absorbent nature. Ground malt is a good thing, as is ship biscuit, toasted bread, crushed beans, oak-

leaves, split peas, and oatmeal. Sweet herbs are excellent, marjoram, sage, &c. Morning and evening let them have a quarter of a gill of water that has been boiled and got cold.

Unless, however, the malady is detected at its outset, it will be worse than useless to attempt to cure it; for if the scabbiness of the ears and nose be allowed to get fast hold on the poor creature, cure is hopeless. Worse still, it becomes contagious, and your rabbit hutch will assume the character of a pest-house. So irradicable is this disease, that I have known scabbiness to lie dormant in the progeny of a doe so afflicted for two and even three years, and then suddenly break out most virulently.

Pot-belly dropsy is occasioned by *wet* vegetable diet. The importance of this subject is my excuse for again alluding to it. Arsenic is hardly more inimical to human life than is wet green stuff to rabbit life. It is a well-authenticated fact that even in a wild state an indulgence in such food is fatal to these animals, for in very wet seasons they may be found lying dead in all directions in the neighbourhood of their warrens.

Pot-belly is incurable. You may patch up an animal for a month or so, but you may depend on the disease again making its appearance. The best plan, therefore, is to get rid of animals so afflicted.

Liver complaint is another ill to which rabbit flesh is heir. You may know when an animal is so affected, by its breathing hard and short. It in no way interferes with a rabbit's good looks, and hardly with its chance of longevity. It would be folly, however, to breed from a liver-diseased doe, as the certain result would be unhealthy little ones. A rabbit with this disease will eat as hearty as any, and his flesh will be not a bit the worse. If I had an animal so circumstanced I should fatten him for killing, bearing in mind, however, that if I loaded him *extravagantly* with fat, he would be sure to die suddenly.

Snuffles is to the rabbit pretty much what a cold in the head is to us, and arises from the same causes—cold, wet, or draught. Make the sick rabbit as comfortable as you can, by covering him in snug, and providing him with warm food, such as aromatic herbs, oats, and bran. Some keepers recommend the use of hemp-seed in such cases, but really I have lost so many pets—furred and feathered—by the use of this heating and oleaginous seed, that I am loth to indorse the recommendation.

For "red-water" (occasioned chiefly by sour food), the best

remedy is mild mucilaginous food, such as dandelion and cnauve. For diarrhœa, sound dry corn, ship biscuit, and baked potato skins.

As soon as an animal evinces symptoms of any disease, part it from the rest and keep it alone, till the clearness of its eye, the brightness of its coat, and its dry and well pelleted dung convince you that it is restored to perfect health.

RABBIT KILLING.

THE most usual mode of killing the rabbit—as being the most sudden and the least painful—is to strike it with the edge of the open palm on the neck immediately behind the poll. After this is done, the throat should be perforated upwards towards the jaws with a small-pointed knife, in order that the blood may drain from the carcase; otherwise the head and neck will, when the creature is hung up, speedily become discoloured from the blood settling in those regions. If the rabbit is not to be dressed at once, it should be hung up by the fore feet, and not, as commonly done, by the hind legs.

LAW RESPECTING RABBIT-SNARING.

BY 7 & 8 Geo. IV., if any person unlawfully and wilfully in the night take any hare or cony in any warren or ground lawfully used for the keeping thereof, whether enclosed or not, every such person shall be guilty of a misdemeanour; and persons guilty of the same offence in the daytime, or using any snare or engine, are subject to a penalty of five pounds. But this does not extend to the taking in the daytime any coniez on any sea bank, or river bank in Lincolnshire, so far as the tide shall extend, or within a furlong of such bank.

THE POET'S PETS.

THE HARE.

THIS emblem of swiftness and timidity is easily distinguishable from the rabbit by the great length of its ears, its long hind legs, its prominent eyes, and the colour of its fur, which is reddish-brown above and white beneath; the tips of the ears are black, as is the upper part of the tail, while underneath it is white: its upper lip is cleft in the centre, and its feet covered beneath as well as above with fur. The total length when full-grown is rather over two feet, and of this the tail occupies three inches.

The favourite abiding-place of the English hare is in the vicinity of rich flat lands; indeed it is rarely discovered in hilly or mountainous districts. Its "form," or nest, is usually beneath some bush or growth of underwood, where it usually lies concealed all day, and comes out at night to feed. The affection of the hare for its "form" is proverbial; and if, when away from it on a love-making or victualling excursion, it is surprised and chased, it will brave almost any danger in making

for home, rather than take advantage of any nearer shelter that may present itself.

It is a very prolific animal, breeding almost as many times in the year as the rabbit, and producing three or four young ones at a birth. The eyes of the young are open at birth. They remain with their mother about twenty days, during which time she suckles them; and after that they start in business on their own account. The food of the hare consists of herbage of almost every kind; but it prefers vegetables of a milky and succulent nature, and, like the rabbit, is very fond of parsley. They are by no means desirable as neighbours, especially to vegetable and corn growers. The havoc a hundred or so of visitors from a "preserve" will make in a field of newly-sprung wheat, in a single night, is incredible; indeed, many extensive farms, owing to their contiguity to a preserve, are worth a less rental by fully half on that account.

The hare does not burrow like the rabbit, but scrapes out a slight depression, so that when she lies in it half-buried in earth and dried herbage, it is a very difficult matter to distinguish her. In countries, however, where the snow lies deep in winter, the animal displays considerable ingenuity in making herself a comfortable domicile. "She does not attempt," says Mr. Wood, "to leave her form as the snow falls heavily around her, but only pushes it backwards and forwards by the movements of her body, so as to leave a small space between herself and the snow. By degrees the feathery flakes are formed into a kind of domed chamber, which entirely encloses the inhabitant, with the exception of a little round hole, which is preserved by the warm breath, and which serves as a ventilating aperture. This air-hole is often the means of her destruction as well as of her safety; for the scent which issues from the aperture betrays her presence to the keen nostrils of the dogs which accompany the solitary hare-hunter, and which are trained to search for these air-holes, and stand sentinels over them until their master arrives and captures the hidden victim."

The hare pairs in February, and very seldom migrates far from the spot where it is born. It seldom utters any cry, and when it does it is a shrill and sharp noise like that of a baby suddenly hurt. As to the charge of timidity so constantly brought against it, it is more than doubtful if it deserves it. Surely the fact of its taking fright at the tramping of an army of horsemen and a troop of dogs is no proof of cowardice. The only proof of a man's pluck is as compared with that of his

kind. A man who declined a "set-to" with a gorilla, would not be scouted as a poltroon, but rather—unless he were well armed, which, of course, puts quite another complexion on the matter—be commended for his discretion. The same man, however, would be expected to resist a human foe—nay, if he were an Englishman and the said foes Chinamen, he might reasonably be expected successfully to resist five of them. Judged by this standard, the hare is a very plucky animal indeed; for, among themselves, the most sanguinary encounters are continually taking place; and it is no uncommon thing to find a hare with its ears torn to ribands by the teeth of its brethren. Besides, we have not far to search for instances wherein the timid hare has shown itself fearless of man himself. Here is one, viewed and related by no less credible a person than the Rev. J. G. Wood:—"A countryman had captured a young leveret in a furrow, and was proceeding to mark it by notching her ears, when he was interrupted in his work by the mother hare, which flew at him with singular courage, and struck so fiercely with her feet that she tore his hands rather severely. Finding that she could not release her child, she stood within a few feet of the captor, and waited patiently until he liberated the little hare, with which she went off."

Whatever may be said of its courage, no one will impeach its cunning. For this quality even master fox himself may own that he is no match for the hare. When the animal hears the terrible voices of the approaching dogs, she at once sets off, nor pauses till she gains some sort of eminence from which she may get a fair view. Her length of ear enables her to catch sounds at a very great distance, and her peculiarly prominent eyes, placed as they are far back, enable her to see almost as distinctly behind as before her. When she pauses to listen for the coming of her enemies, she rears on her long hind-legs and so obtains a tolerably extended view. When hard pressed, she is capable of the most crafty manœuvres for the purpose of throwing the dogs off the scent. It has been known to leap to the top of a close cut hedge, and to run along for a considerable distance; to betake itself to furze bushes, and to leap from one to the other without touching the ground; to run forwards for a considerable distance, and then, after returning for a few hundred yards on the same track, to make a great leap at right angles to its former course, and lie quietly hidden while the hounds ran past its place of concealment; then to jump back again to its track, and steal

quietly out of sight in one direction while the dogs pursue another. It has even been known to start a fresh hare, leaving it to the tender mercies of the hunters, while she squats securely in the deluded creature's form.

Length of limb and freedom from fat enable the hare to make tremendous speed, and to venture leaps calculated to daunt the most enthusiastic dog. It has been seen to leap a perpendicular wall eight feet in height. They, however, are not methodical in running, and frequently exhaust their strength with the first burst.

Hares take to the water with the greatest readiness. Instances of their crossing brooks and rivulets, in their endeavours to balk their pursuers, are plentiful enough; but here is a story—Mr. Yarrel tells it—of hares putting out to sea for the fun of the thing:—"A harbour of great extent on our southern coast has an island near the middle, of considerable size, the nearest point of which is a mile distant from the mainland at high water, and with which point there is frequent communication by a ferry. Early one morning in spring, two hares were observed to come down from the hills of the mainland towards the sea-side; one of which from time to time left its companion, and proceeding to the very edge of the water, stopped there a minute or two and then returned to its mate. The tide was rising; and after waiting some time, one of them, exactly at high water, took to the sea, and swam rapidly over in a straight line to the opposite projecting point of land. The observer on this occasion, who was near to the spot, but remained unperceived by the hares, had no doubt they were of different sexes, and that it was the male that had swam across the water, as he had doubtless done many times before. It was remarkable that the hares remained on the shore nearly half an hour; one of them occasionally examining the state of the current, and ultimately taking to the sea at that precise period of the tide called slack water, when the passage across could be effected without being carried by the force of the stream either above or below the desired point of landing. The other hare then cantered back to the hills."

Who will dare speak against the hare after this? Who will impeach his courage, or deny that he is a gallant fellow? What a catalogue of virtues the above little narrative—nay, romance—reveals this hare to possess! That he was a hare respected by his friends—and doubtlessly deservedly respected—is shown by the fact that his father or brother—nay, per-

haps his mother—came down to the shore to see him off; that he was a bold hare is clear by his taking to the water without a moment's hesitation, although a mile of dreary ocean was before him; and that he was an affectionate hare is evidenced by the purpose that led him to undertake the perilous voyage. It is really quite nice to find that the noble fellow's love was appreciated, and that his sweetheart came down to the beach to receive him. Did he press his hare-lip to hers, and did their happy tears mingle on the strand? The narrator saith not; but that such was the case there is little doubt, and that it was from these tokens that Mr. Yarrell's informant gathered the inference that they were sweethearts long attached, and had "met many times before."

Animals of the hare species are found throughout Europe and America, and indeed in other parts of the world; but none of them exactly resemble that with which we are familiar. The hare found in Ireland, for example, was long thought to be merely a variety of the English animal; but the indefatigable Mr. Bell detects the following differences. The Irish hare is somewhat larger; the head is somewhat shorter; the ears are even shorter than the head, while those of the English hare are fully an inch longer; the limbs are proportionally rather shorter, and the hinder limbs do not much exceed the fore-legs in length. The fur is also remarkably different: it is composed exclusively of the uniform soft and shorter hair which in the English species is mixed with the black-tipped long hairs that give the peculiar mottled appearance of that animal; it is, therefore, of a uniform brownish colour on the back and sides. The ears are reddish grey, blackish at the tip, with a dark line near the outer margin. The tail is nearly of the same relative length as in the common species.

Distributed through Norway, Sweden, Russia, and Kamschatka is an animal called the Varying hare. The fur, which is full and soft, is in summer grey intermixed with silky hair of a yellowish brown; the ears are tipped with black, and the under parts are light grey. The tail is white beneath and grey above. As the winter approaches, the fur gradually becomes white, except that on the lips and the tips of the ears, which remains black. In the "Edinburgh Philosophical Journal," vol. ii., is an interesting account of the process as it occurs in Scotland, from which it would seem that the winter change of colour takes place without any removal of the hair. "About the middle of September," says the writer in the "Journal,"

" the grey feet begin to be white, and before the month ends all the four feet are white, and the ears and muzzle are of a brighter colour. The white colour gradually ascends the legs and thighs, and we observe under the grey hairs whitish spots, which continue to increase till the end of October; but still the back continues of a grey colour, while the eyebrows and ears are nearly white. From this period the change of colour advances very rapidly, and by the middle of November the whole fur, with the exception of the tips of the ears, which remain black, is of a fine shining white. The back becomes white within eight days. During the whole of this remarkable change in the fur no hair falls from the animal; hence it appears that the hair actually changes its colour, and that there is no renewal of it. The fur retains its white colour until the month of March, or even later, depending on the temperature of the atmosphere; and by the middle of May it has again a grey colour. But the spring change is different from the winter, as the hair is completely shed."

The American hare is not much larger than the common rabbit, by which name, indeed, it is only known throughout the northern parts of America. The Summer hare is dark brown on the upper part of the head, lighter on the sides, and of an ash-colour below. The ears are wide, edged with white, tipped with brown, and dark-coloured behind; tail dark above, white underneath, having the under surface turned up; the fore legs are shorter and the hinder longer in proportion to the European. In the middle and southern States the change in the colour of the hair is by no means as remarkable as it is further north, where it becomes nearly white. It is not hunted in America, according to the English acceptation of the term, but started by a dog and shot, or it is caught in various sorts of traps. It has the same kind of leaping gait as the European hare; and, like that animal, it breeds several times in the course of a year. It is not of a migratory nature, but always continues to haunt the same places, taking occasional refuge under the roots of trees, or in the hollows near the roots.

Mr. Gosse, in the " Canadian Naturalist," gives the following information respecting the American hare, together with how the noble Canadian performs the sport of " twisting " a hare: " The American hare is found pretty generally over North America, from this province even to the Gulf of Mexico, where it is more common than it is with us. Here its winter coat is nearly white, but in the summer it is of a yellowish brown,

with a white tail. It makes a nest or bed of moss or leaves in some hollow tree or old log, whence it issues chiefly at night. Though not so much addicted to gnawing as the squirrels, yet, as its teeth are formed in the same manner, it probably resembles them in its food, eating various kinds of nuts and seeds, as well as green herbs. It is said also occasionally to peel off the bark from apple and other trees. A singular mode of taking furred animals out of logs, hollow trees, &c., is practised in the South, called 'twisting.' I once saw it performed on a rabbit (so called). The dogs had tracked him, and driven him to his hole at the bottom of a hickory-tree. The hole was too small to admit the hunter's hand with convenience, so we made the negroes cut down the tree, which was soon accomplished. When it fell, we watched the hole to see that the rabbit did not run out, but he did not make his appearance. The hunter then got some long slender switches, and probing the hollow, found that the rabbit was at the further end, several feet up the trunk. He now commenced turning the switch round in one direction a great many times, until the top of it had become so entangled in the animal's fur as to bear a strong pull. He then began to pull steadily out, but the rabbit held on as well as he could, and made considerable resistance, crying most piteously like a child; at last the skin gave way, and a great mass of fur and skin came out attached to the switch, pulled off by main force. He now took a new switch, and commenced twisting again, and this time pulled the little thing down; but the skin was torn almost completely off the loins, and so tightly twisted round the end of the sticks that they were forced to cut it to set the poor animal free."

There exist several animals of the Rodent genus that have little or nothing of the "hare" about them but the name. Such are the Calling hare, the Ogotona hare, and the Cape hare. The first of these is a little animal barely so large as a rat, inhabiting the deserts of Chinese Tartary. It burrows like the rabbit, and constructs a warm nest at a little depth from the surface. They are curiously prudential in their habits, and not only at the fall of the year accumulate various herbs against hard times, but—or the accounts of travellers are not worthy of credit—"construct hemispherical ricks of hay about a foot high for their support during the inclement season."

The Calling hare somewhat resembles the Ogotona, but is even smaller. Its head is comparatively longer than the true

hare's, and is thickly covered with fur even to the tip of the nose. It is an inhabitant of the south-east parts of Russia, and is an animal of so solitary a nature as to be seldom seen even in places most frequented by it. They burrow, and the mouth of their den is little more than two inches in diameter. The voice of the Cape hare is said to resemble the piping of a quail, but is so loud as to be heard at the distance of half a mile. Both the male and female emit this note, but the latter is silent for some time after she has given birth (in May) to her young, which are born naked and blind, and are carefully attended to by the mother, who covers them up warm with the cosy materials of her nest.

The Cape Leaping hare, or Spring hare, or Jumping hare, is certainly more like a kangaroo than what we are accustomed to think should be a hare's shape. It is a native of Southern Africa; the hinder legs are very long, and the fore-legs remarkably short; the tail, which is thickly covered with bristly hairs, is as long as its body. The fore-legs have each five toes armed with strong claws, by means of which the animal digs its burrow. The hinder feet are furnished with four claws, less heavy than those on the anterior toes, but sharper. Its leaping powers are prodigious; it will clear from twenty to thirty feet at a jump, and keep this up for a considerable time. It resembles our hare in the shape of the head (except that the ears are shorter) and in the texture of the fur. It is of nocturnal habits, and is seldom seen abroad. "The natives," says a naturalist, "who set some value on the flesh, take advantage of this habit, and being sure of finding the Spring hare at home during the daytime, take their measures accordingly. Placing a sentinel at the mouth of the burrow, they force the inmate to evacuate the premises by pouring a deluge of water into the hole, and as it rushes into the open air it is seized or struck down by the ready hand of the sentinel."

To return, however, to *Lepus timidus*, the common English hare. Why a "Home Pet?" One has heard of frogs responding to a friendly whistle; of "death-watches" cheerfully responding to the tap of an acquaintance at the wainscot behind which they reside; of poisonous serpents reposing peaceably in the bosom of an Indian family; but whenever was the shy, nervous, solitude-loving hare known to afford to a home delight in any other shape but jugged or roasted? My dear reader, you have only to try your hand with a very young leveret, and you will possibly alter your opinion. You may

experience some difficulty in taming the wild little creature, but KINDNESS must conquer. Under the influence of this virtue, wolves may be brought to lick the hand with innocent tongue, and even lions and tigers be made grateful. One of the oldest and most experienced of living hunters says, "without doubt the two most savage beasts in the world—the most crafty and unconquerable—are the wild boar and the panther;" yet this latter animal was so effectually tamed by Kean the tragedian, as to follow him about like a dog.

Instances are not wanting of the hare's tamability. Some time ago there was exhibited in Liverpool a troop of performing hares, seven in number. They would sit round a table with napkins tucked under their chins, and partake of dinner in the most decorous manner; five of them harnessed to a little carriage, in which sat a little girl, galloped round the circus, while a hare with a cocked hat drove, and a hare in scarlet breeches and powdered wig stood behind. They played a game of hare-hunting; one animal representing the hunted, and the other six the dogs; the first hare doubling and hiding behind baskets and stuffed sacks, and leaping and dodging in all sorts of ways to throw her pursuers "off the scent," and consented to be tousselled and laid as dead when the make-believe dogs overtook her. Many other tricks were performed by these animals, plainly showing that they are capable of considerable education. Why not? Surely they possess all the elements—cunning, impetuosity, daring, and affection; and if the cultivation of these qualities will not make an animal entertaining and companionable, why, then there is an end of pet-keeping.

The celebrated poet Cowper kept hares among the pets that cheered the solitude of his summer residence at Olney. Puss, Bess, and Tiny were the names of the animals whose association with the poet has rendered them famous. That so gentle-minded a man should have been able to obtain such perfect control over the animals in question is surely proof sufficient that hare-taming is a simple business, after all.

THE HEDGEHOG.

DESPITE his spiky suit, our friend the hedgehog claims a place in our category of Home Pets. Why not? His spikes are for his enemies, not for his friends; he is of a peaceable disposition and easy of domestication; his habits are highly curious as well as instructive and amusing, and he is able to repay with ample interest the kindness you may bestow on him.

He bears a bad character; bears it because he cannot help himself; but he deserves it no more than many other harmless creatures against whom superstition sets its thick head. The farmer detests the hedgehog. "Doesn't it steal my poultry, and rob my hens of the very eggs they are sitting on?" asks the indignant man; "doesn't the prickly little thing *milk my cows* in the night?" To the first question it may be replied, that the hedgehog is guilty. He *does* steal eggs; but he never steals more than he can eat, and those which he does eat are consumed in a decent and clever way. He does not break the egg and lick up all that may be saved, as would a bungling animal; he takes it gingerly between his forepaws, bites off the small end, and sucks out all that the shell contains, without wasting a drop. To the question, "Doesn't he milk my cows?" No, may be distinctly given as answer. It is impossible. It could no more take the cow's large teat into its tiny mouth

than it could fetch a milking-stool and a pail, and relieve the animal's udder milkmaid-fashion. Not but that it is very fond of cow's milk, and never loses an opportunity to satisfy its craving; if the milkers are tardy, and the cows are allowed to lie about with the luscious liquid trickling from their teeming udders, any hedgehog that may happen to be in the neighbourhood will certainly scent out the circumstance, and possibly be found busily licking and lapping close to the teat. There can be no doubt that the delusion concerning the cow-sucking habit of the hedgehog is founded on this fact.

The hedgehog has been likewise accused of being an orchard-robber. He has been seen trudging home to his family with his spines loaded with pippins. It is supposed to climb up a tree, bite off the fruit at the stalks till a goodish many fall and accumulate at the foot of the tree, and then descending, roll itself over the fruit till a load is impaled. For this delusion, as well as the above-mentioned, there is ample ground; as, says Mr. Wood, "hedgehogs do occasionally walk about with apples on their spines, for I have been told so by an eye-witness to the fact, a man who was rather given to the study of natural history, and who had been much struck with the circumstance. But although they may be occasionally seen with an apple or so sticking on their backs, yet the apples most probably came there accidentally. It is a very common thing to find a hedgehog covered with leaves, through which its spines are thrust, but we do not therefore accuse it of eating leaves. In all probability the creature had been alarmed, and had hastily rolled itself up in a spot where apples were lying, and in that case some of them would be nearly certain to adhere to the spines."

Nothing comes amiss to the hedgehog in the shape of food: fish, flesh, fowl, vegetables, grubs, worms, and insects, all are devoured with more or less relish. It has been denied that the animal in question will eat vegetables, but it is sufficient to know that so creditable an authority as the author of the "Natural History of Selborne" declares the contrary. Wild fruit, crabs, haws, &c., says Mr. White, form part of its diet; and the same gentleman enters into a long and curious account of the manner in which a hedgehog in his possession contrived to devour the roots of a plantain without injuring the leaves. It devours large quantities of worms, and its mode of operation is deserving of observation. The Rev. L. Jenyns thus describes the business:—"I fell in with a hedgehog to-day in my walks, in a sheltered part of the garden, which I

was enabled to watch unobserved, and which afforded me an opportunity of seeing a little into their habits and mode of feeding. It was creeping up and down a grass walk, apparently in busy search for worms. It carried its snout very low, insinuating it among the roots of the herbage, and sniffing under the dead leaves which lay about. After a time it commenced scratching at a particular spot to which it seemed directed by the scent, and drew out a very large worm from just beneath the surface of the ground. This it immediately began to devour, taking it into the mouth by one extremity, and gradually eating its way to the other—an operation which lasted some time, and was attended by an incessant action of the teeth, which grated upon each other with a peculiar noise. After the worm was all gone, as I thought, I was surprised to see the whole put out of the mouth again, and from the appearance of the earth I was led to believe that it had only been subjected to the action of the teeth for the purpose of being bruised, and squeezing out the soft internal parts of the body, which alone were eaten in the first instance. The skin itself, however, was shortly retaken into the mouth, and the whole clean devoured. From the above observation, it is probable worms form no inconsiderable part of the food of the hedgehog, and that they are enabled to detect them by the smell and to extract them from the ground with their snout, after the same manner that the hog uses his in searching for buried food. In the instance observed by me no attempt was made to kill the worm before eating it, but that part of the poor creature that was still out of the mouth of the hedgehog kept up a continued writhing as the nibbling of its other extremity proceeded."

Clumsy as it appears, it somehow manages to capture such swift creatures as the hare and rabbit. Some time ago, in Cumberland, a hedgehog was caught in the act of killing a hare, on which it had inflicted such injuries that it died shortly after it was rescued. The insect tribe, however, form the staple of its food. It is very partial to bees, and, thanks to its impenetrable armour, it is not afraid of the sharp stings of the outraged honeymaker. With its spiky hide covered with indignant and furious bees, the hedgehog, having effected burglarious entry into a nest, calmly munches away at the grubs and the honey, and then trots off unscathed as little in body as in conscience.

The stomach of the hedgehog would seem to be invulnerable to poison. Corrosive sublimate it devours with a relish, and

the same with hydrocyanic acid and cantharides. More singular still, it can bear the bites of the most venomous snakes without experiencing any ill effect. Dr. Buckland tested this property of the hedgehog. In the same box he placed one of the animals in question with a common snake. For a time the snake crept about as though unaware of the hedgehog's presence, while the latter experienced, or effected, the same ignorance of the close proximity of its fanged enemy, and remained coiled up like a ball. The hedgehog was then laid on the snake; but still it maintained its apathy till the snake moved slightly, when the hedgehog untucked its head, and seeing—seemingly for the first time—the snake, gave it a severe nip with its teeth, and at once resumed its coiled-up attitude. Three times the snake wriggled, and three times the hedgehog put out its head and bit it—the third time so hard that the poor reptile's back was broken. Its immediate behaviour, on finding that its enemy was powerless, certainly went to contradict its previous assumed indifference. It no longer remained coiled up, but waking to sudden activity, it took the tail of the unlucky snake in its mouth and deliberately bit it from one end to the other, just as Dr. Jenyns saw the worm served, only in this case the body of the snake was too large to be contained in the hedgehog's mouth. Having mumbled the snake thoroughly, it began to eat it, and by the next morning it was totally consumed.

Another naturalist relates the case of a viper and a hedgehog being boxed up together. The hedgehog was the first to commence hostilities, and the snake being irritated, rose up and bit its assailant smartly on the under lip. The hedgehog took little notice of the incident, but, after licking the wounded spot once or twice, returned to the charge. At last it succeeded in killing the viper; and, after having done so, ate its vanquished enemy, beginning at the tail, and so working upwards.

That the hedgehog is an hybernating animal is beyond dispute, and may be said to be more completely so than even the dormouse, for the latter will rouse a few times from its long sleep and partake of the store of food it has laid up; but in the case of the hedgehog, such hoarding is impracticable, on account of its flesh-eating habit. It is a burrowing animal, preferring crevices in rocky ground, or among the stones of some ruined building. Sometimes it bores itself a snug nest beneath the roots of a tree, or, should the tree be hollow, it will have no objection to take its abode within. Some hedgehogs are too lazy to provide a house of their own building, and will take

liberties with the abode of the mole or some other burrowing animal. A rabbit-burrow is not considered by the hedgehog to be bad lodging; or perhaps, and considering the many young rabbits running about, it would be more correct to say board and lodging.

The nest of the hedgehog is a curious edifice, and so admirably contrived with a thatching of leaves, that during the heaviest rains the tiny hedgehogs within remain snug and dry. The young come into the world about May, and look certainly as though they would never grow up to be like their parents. They are very little, and, when born, deaf as well as blind. The quills on their backs are soft and delicately white, and beneath them the tender pink skin plainly shows. While still in its babyhood, the hedgehog's tail plainly shows, because its bristles are not sufficiently long to cover it; in the adult animal, however, unless the tail be searched for, it is not apparent —it is very short, not exceeding three quarters of an inch in length.

The hedgehog's spines are of very singular character; their elasticity is marvellous. Mr. Bell relates that a hedgehog belonging to him was in the habit of fearlessly throwing itself off a wall fourteen feet in height, trusting to the elasticity of its spines to save it from injury: it made no stop or hesitation, but threw itself over at once, contracting into a ball as it fell, and, after it reached the ground, it would lie quiet for a few moments, and then unfold itself and run off.

The way in which the spines of the hedgehog are attached to its skin is very remarkable; thanks, however, to the Rev. J. G. Wood, the reader may be made easily to comprehend the manner in which the spines are set, "through the medium of a piece of leather and a few pins: Take a piece of tolerably stout leather, and push a dozen pins through it up to the very head. Now bend all the pins so that their points will form an angle of about 45° with the leather. That is the way in which the spines are fixed to the skins; but if we wish to see how the hedgehog is enabled to raise these spines, we must do something more. Take a piece of linen and lay it against the inner side of the leather, fastening all the heads of the pins to it. Now if you draw the linen towards the direction in which the points of the pins lie, you will find that all the pins will stand upright, the pins forming levers of which the skin is the fulcrum. The linen will represent that extraordinary muscle which lies under the skin of most animals, and is developed to

such an extent in the hedgehog. By means of this muscle the hedgehog is enabled to retain its position when it has curled itself into a ball. The muscle is not so very powerful on the back, but is enormously large along the sides. When, therefore, the hedgehog fears an enemy, it tucks its head under its breast, at the same time drawing its legs within the scope of this muscle, which, by its contraction, forms a complete rope round the body, binding it together with such force that the animal cannot be opened without rending asunder this muscle: however, there are no animals who would attempt such a feat; for, at the same time that the animal curls itself round, the contraction of the muscle draws all the spines upright, and offers a *chevaux-de-frise* which few wish to encounter."

Gipsies and that sort of folk declare that, for eating, the hedgehog is to be preferred to the duck or chicken; and it should be borne in mind that evidence derived from such a source should by no means be despised. Were honest house-dwellers the witnesses, it might be supposed that economy had to do with the choice; but, as a rule, hedgehogs and fowls cost the gipsy the one no more than the other, and therefore his judgment may be regarded as impartial. The gipsy cooks his hedgehog in the same way as he cooks any duck or chicken that may wander into his tent. The bristles are first singed off, or nearly, and then the carcase, encased in a pasty of fine clay, is buried in the glowing ashes of the camp fire. When the clay cracks, the hedgehog is known to be done, and on being disentombed, it is reeking and delicious; the outer skin has peeled off, leaving it delicately white, and though, as may have been observed, the process of embowelling has not been performed, if it is opened now, the whole of the intestines will be found to have shrivelled together, and come away in a dry mass. Persons who have had an opportunity of tasting a fowl cooked in this way, declare that stove-cooked poultry bears no sort of comparison with it for excellence.

Should the reader, hitherto hedgehogless, be inclined to keep one of these interesting creatures, he must be prepared at first for some little trouble. It will be as shy as a strange cat, and as inclined to hostility, making its appearance only when hungry, and then vanishing, goodness knows where—under the floor-boards, probably, or up the chimney. This state of things, however, will not continue, especially if it be fed by one person, and with tolerable regularity. It is popularly believed that if the hedgehog is once rendered "drunk and incapable," he will

ever after be docile and obedient. This has been regarded as one of those funny double-edged sayings for which our forefathers were so remarkable: "Mustard too well mixed is poison;" "A stab in the throat is a sure cure for toothache," &c.; and as it is held impossible to mix mustard *too well*, or to be conscious of any pain, toothache included, after a severance of the windpipe, so it was held with regard to the hedgehog, *if* you could make him tipsy through strong drink (no easy matter, it would seem, with a creature with a relish for corrosive sublimate), he would be straightway rendered tame. The celebrated Dr. Ball resolved to test the hedgehog's invulnerability to strong drinke, and presented him with a saucer of stiff whisky-and-water. The doctor himself shall tell the result.

"Like the beasts that so indulge, he was anything but himself, and his inane leaden eye was rendered still less pleasing by its inane drunken expression. He staggered towards us with a ridiculous get-out-of-my-way sort of manner; however, he had not gone far before his potation produced all its effects—he tottered, then fell on his side; he was drunk in the full sense of the word, for he couldn't even hold by the ground. We could then pull him about, open his mouth, twitch his whiskers, &c., for he was unresisting. There was a strange expression in his face of that self-confidence which we see in cowards inspired by drinking. We put him away, and in some twelve hours afterwards found him running about, and, as was predicted, quite tame; his spines lying so smoothly and regularly that he could be stroked down the back and handled freely. We turned him into the kitchen to kill cockroaches, and knew nothing further about him."

It is a pity that so interesting a narrative should end so unsatisfactorily. Was he turned straight into the kitchen as soon as he had partially recovered from his tipsy bout? If so, but little reliance can be placed in his meak demeanour. It is possible that the recovering grog-drinker was merely qualmish, and headachy, and ashamed. I have seen human hedgehogs the morning following a debauch so prostrate and penitent as even to submit to the mild reproaches of their well-meaning wives without in any way "setting up their backs:" but, alas! they have relapsed, as might—for all Doctor Ball knows to the contrary—the hedgehog in question, and remained throughout his life a dissipated hedgehog, given rather to draining beer-jugs and tumblers, and dozing under the cask in the cellar, than to sobriety and beetle-catching.

Apropos of the hedgehog's talents as a beetle-catcher, rather a curious story is told of one that lived in the house of a celebrated naturalist. Like good Dr. Ball, the gentleman in question having purchased the hedgehog, turned it into the kitchen and "knew no more about it." He, however, was doomed to meet it again, and under very peculiar circumstances. In a cabinet in his library he had stored a valuable collection of tropical beetles, which suddenly took to vanishing in the most mysterious manner. That they were as "dead as door-nails" there could be no doubt, and, moreover, each was impaled in its proper place; but sure as the morning came an examination of the cabinet—which was locked—showed that a dozen or so had decamped after having adroitly withdrawn the spike from their bodies. Who was the culprit? Had a brother naturalist lived in the house, it might have been suspected that sheer professional envy might have led to the theft; but as it happened, there was beside himself nobody on the premises but an old housekeeper, whose horror of beetles was only equalled by her aversion to mice. Still the purloining continued, and there was nothing left but to watch for the delinquent. One night the owner of the cabinet having hidden behind a screen and blown out the light, remained very quiet, when about midnight his wakeful ears were aware of a scratching and creaking evidently proceeding from the precious cabinet, which, on this occasion, had been left unlocked. It was too dark to see, but without doubt the burglar was at that moment in the room; so grasping the sword with which he had provided himself, the indignant naturalist crept from his hiding and cautiously advanced towards the cabinet. He came close to it, passed his hand over it; still no midnight thief was leaning over it or crouched beneath, and still the rasping and crackling continued. The thief then must be *inside*. Swiftly raising the lid, the worthy man made a sweep within with both his hands, which was followed by a loud squeak and a terrible sensation of a hundred pins entering his fingers and palms, and which instantly convinced him that the thief was the hedgehog from the kitchen, which in a lucky moment had discovered the treasure-door open, and at once established himself in a dark corner.

With regard to the way in which the hedgehog should be treated when installed as beetle-catcher in your kitchen, many important hints may be gleaned from the following narrative supplied by a correspondent to a popular journal:—

"London houses are usually infested with beetles and cock-

roaches, not unfrequently with rats, and mice, and spiders. Now all your beetle-traps, rat-traps, mouse ditto, poisons, or infallible insect-powders are as nothing compared to the services of a hedgehog, who will clear the kitchen and cellars in a very short space of time. Londoners have become aware of the serviceable nature of this creature; but when, in answer to some complaint of a neighbour about being tormented with black beetles, we have advised the keeping of a hedgehog, we have generally met with the reply, 'But we never can get one to live, they always die in a month.'

"At first, this used to perplex us greatly; and when we, in our turn, began to suffer under this beetle grievance, the experience of our neighbours deterred us from trying our own remedy. At length, the enemy grew so bold and increased so greatly in force, that one day, in pure desperation, we determined to provide a hedgehog, and bought one accordingly in Leadenhall Market. When we got him home, we christened him Peter, and gave him a mansion beneath a disused kitchen copper, with plenty of hay, a large supply of water, and a good supper of bread-and-milk, which we had always been told was amply sufficient to satisfy the cravings of the creature's appetite.

"We soon discovered why our acquaintance could not keep their hedgehog alive. Belonging to the order *Carnivora*, these animals, when in a domestic state, rarely have any meat given them. Many persons, indeed, have a fixed notion that the vermin they destroy is sufficient to sustain life, or they vaguely attribute to the hedgehog the fabled chameleon ability of living on air.

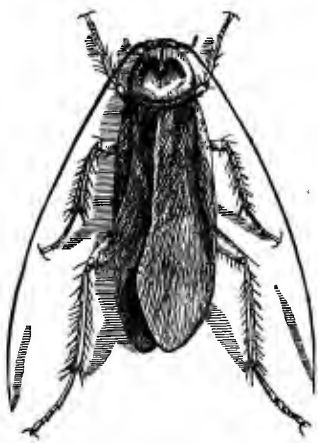
"One of our family who has a passion for every creature belonging to animal nature, undertook to tame Peter, and ascertain his likings, tastes, and habits. Of course she fed him; that is the first key to animal affection. He soon came to recognize the hand on which he depended for daily food. He makes but one meal per diem, and that about one o'clock p.m.; and if the hour goes by without his food being placed, he utters a peculiar noise, resembling a grunt, sneezes frequently with the force and fervency of a cat, and testifies much uneasiness. He requires meat pretty frequently, and is very partial to a bone with a good deal on it. He unrolls himself at the touch of his mistress, and places his bristles down, so that she can stroke him; he will even play occasionally, stretching out his paws—so like a monkey's—and will some-

times lick the hand of his feeder; though it is not be denied that he has his tempers, and is sometimes surly, and consequently very prickly. He was extremely light when he first came into our possession, but after a course of good feeding he became quite fat, and spread considerably in his proportions. In a fortnight he had cleared away every beetle on the premises, though previously we had tried every known antidote to destroy these pests. Cucumber-parings, which they devoured, and which did *not* kill them—as we had been assured they would; pans of beer, with little ladders to give them access to the liquor, which they drank and ran away again, the topers, instead of, as we fondly hoped, drowning themselves in the strong drink. Peter knocked them all off, and wanted more, judging from the noise he made every night after dark, resembling a cat walking about in walnut-shells; indeed, Peter at first alarmed us considerably by knocking about the saucepans and kitchen utensils with a force which once or twice convinced us that housebreakers were on a visit. He made these noises, we found, in researches after rats and mice, with which, in its free state, the hedgehog satisfies its carnivorous instincts. It is, indeed, more valuable in the destruction of rats than either cat or dog. Descending one morning early into the kitchen inhabited by Peter, we were horrified on seeing the floor soiled with large spots of blood, and markings of claw-like feet in the same sanguine colour. We examined the cat, who was suspected of being secretly an enemy to Peter; but puss was perfectly serene and unwounded. Then the hedgehog was dragged out of his hole, and, to our dismay, we found the poor creature's eyes were closed, one of them being apparently torn out. The carcase of a rat, half-devoured, being discovered, we came to the conclusion that the creatures had been engaged in mortal conflict, in which poor Peter had lost his beautiful eyes—eyes of dark blue, which, though not over bright, were nice intelligent eyes. We were sorry to think that for the rest of his days he must grope in the dark; but, in a month's time Peter had perfectly recovered his eyesight, even the orb where only a vacuum could be seen.

"Peter has become a household pet; but truth demands that we should not conceal his faults. He is by no means cleanly in his habits; he is untidy in his eating, and is positively addicted to thieving. In winter he never appears to be warm enough, but goes about foraging for bedclothes—stealing all the stray towels, house-flannels, and pieces of cloth and

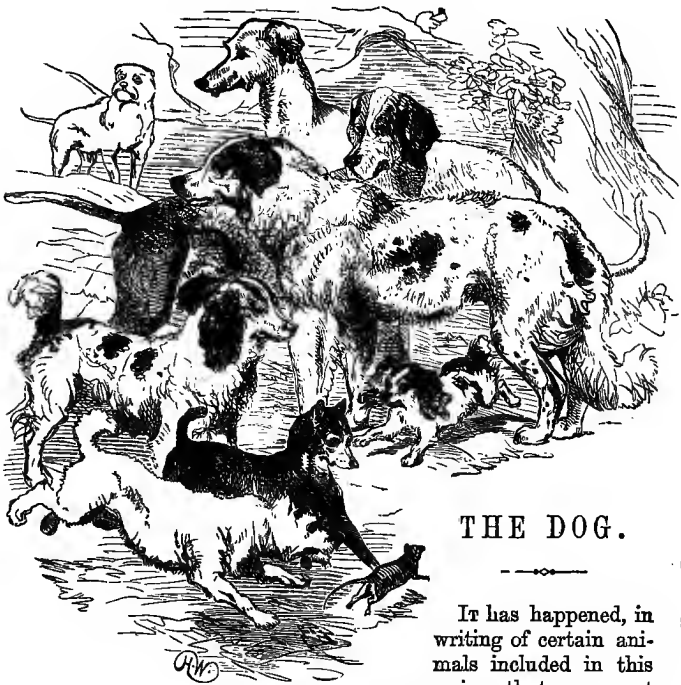
carpet which fall in his way. These are faults intolerable in the sight of tidy housewives; but somehow Peter has grown to be a necessary evil, for he keeps the house free from vermin, and is therefore quite worth the trouble he gives."

Animals of the hedgehog species are found in other parts of the world besides Britain. In Asiatic Russia the long-eared hedgehog is found. This is smaller than that with which we are familiar, and its ears are curiously broad and long, and give to the creature's head an even more piggish appearance than that borne by the common hedgehog. The prickly covering of the Russian animal does not extend over the body, as with the British, but rather sits on it like a load of quills hanging over the rump and sides. Then there is the Madagascar hedgehog, or Tamec. Its body is well covered with spines; its food, as with the British species, consists of worms, insects, reptiles, &c.; it hybernates like the common hedgehog; yet in many respects it is different. It cannot roll itself into a ball; its snout and legs are very much longer in comparison, and it has no tail. It possesses a powerful odour of musk, but is as much esteemed as an article of food among the natives of Madagascar as is our common hedgehog among the skulkers in our own woods and forests.



THE HEDGEHOG'S CHOICEST PREY.

W. DICKES.



THE DOG.

It has happened, in writing of certain animals included in this series, that some sort of justification, or, at least, explanation, was necessary for including them among Home Pets. As regards the creature now under consideration, however, he claims his right to the title of Home Pet,—nay, as something infinitely more dignified,—as Home friend and protector. He has proved his right. It has been acknowledged more than two thousand years, and doubtless would have been a very, very long time before, but at that early period, he was only common to Eastern countries, whose inhabitants, as is the case even to this day, as a rule treat the faithful fellow with unjustifiable contumely and contempt. As truly says Cuvier, "the dog is the most complete, the most singular, and the most useful conquest ever made by man. The dog, far more than any other animal, becomes a humble friend and companion of man, often seeming

actually to know and sympathize with the joys and sorrows of his master; and on this account it is that he is alike the pampered menial of royalty and the half-starved partaker of the beggar's crust." When the anecdotal chapter of this section is arrived at, I have no doubt that the reader will be of the same opinion with the great Cuvier.

There is so much to say about the dog, that to the important subject, the *origin* of the domestic dog, much too little space can be spared. All sorts of theories have been started. According to some, all domestic dogs are to be regarded as one species; and, as that species is not certainly known to exist in a truly wild state, all the wild dogs, which must be admitted to belong to the same species, being viewed as the offspring of domestic dogs, which have returned to a wild state; while, however, it is supposed that the original type or characteristics of the species modified by domestication have in a great measure disappeared. Other writers insist that there are numerous species of dog, originally distinct, and differing, to a notable extent, not only in size and other physical characters, but also in disposition and instincts. A clever writer of this latter way of thinking, says: "It seems to have been too hastily taken for granted, in favour of the opinion that there is only one species of dog, that all the wild races, even the Dholes (Kholsun is this animal's native name, and it inhabits the western frontiers of British India), and the dingo, have sprung from domestic progenitors. There is certainly no evidence of this; and the fact that wild races exist, exhibiting marked diversities of character in countries widely remote and of very different climates, is referred to with confidence on the other side, as affording a strong presumption in favour of the supposition that man has in different countries domesticated the different species which he found there. We do not yet know enough of the amount and limits of the changes which circumstances may produce to warrant any confident conclusions on that ground; and if we were to adopt the views of those who ascribe least to such causes, we might yet demand them to show why, although from certain original types no mixed race can originate, there may not yet be other original types capable of such combination, or why the limits must be held equally impossible between all that were framed by an original act of creation. That there was only one original pair of the human race, may be held without one, of necessity, holding that there was originally but one pair of dogs."

One of the most able of modern naturalists, Mr. Bell, ascribes to the dog and the wolf specific identity. The period of gestation—sixty-three days—is the same in both animals. One of the most forcible arguments against the dog's wolfish origin is the obliquity of the eyes of the latter compared with the former. Mr. Bell, however, meets this objection by a reasoning decidedly ingenious, if not conclusive. "It may result from the animals' constant habit, for many successive generations, of looking forward to their master and obeying his voice."

Against the identity of the dog and the wolf, the difference of disposition has been strongly urged. The last-quoted authority, however, is prepared for this objection, and rebuts it by relating two anecdotes,—one on his own authority, and the other on that of Cuvier. The first occurred in the gardens of the Zoological Society, and was exhibited in the person of a she-wolf, who came forward to be caressed, and even brought her pups to be caressed also, whenever Mr. Bell, or any one whom she knew, approached her den. Indeed, she killed all her unfortunate young ones in succession, by rubbing them against the bars of the cage in her zeal to have them caressed by her friends. The second happened in the Ménagerie du Roi, at Paris, and no faithful dog could show more affecting instances of attachment to its master, or distress on account of his absence, than did the male wolf, the subject of Cuvier's touching account. "With all these analogous properties of form and structure," continues Mr. Bell, "as well as of disposition, I cannot but incline at least to the opinion that the wolf is the original source from which all our domestic dogs have sprung; nor do I see, in the great variety which exists in the different races, sufficient ground for concluding that they may not all of them have descended from one common stock. The turnspit and the mastiff, the pug and the greyhound, are, perhaps, more unlike each other than any of the varieties of other domestic animals; but if it be true that variation depends on habit and education, the very different employment to which dogs, in all ages, have been trained, and the various climates to which they have been naturalized, must not be lost sight of as collateral agents in producing these different forms. The care, too, with which dogs of particular breeds are watched with smaller ones, for the purpose of keeping the progeny as pure as possible, has, doubtless, its effect in promoting such distinctions. . . Upon the whole, the argument in favour of the view which I have taken, that the wolf is probably the origin of all the

canine races, may be thus stated: the structure of the animal is identical, or so nearly, as to afford the strongest *à priori* evidence in its favour. The dog must have been derived from an animal susceptible in the highest degree of domestication, and capable of great affection for mankind; which has been abundantly proved by the wolf. Dogs having returned to a wild state, and continued in that condition through many generations, exhibit characters which approximate more and more to those of the wolf, in proportion as the influence of domestication ceases to act."

One of the most decided objectors to the above theory is Mr. Richardson, and though that gentleman may not be so profound a naturalist as Bell or Cuvier, he gives instances as well as opinions, and, on that account, at least, his evidence is valuable. His arguments are terse, energetic, and to the point:—

"I positively deny this assumed identity of structure. The intestines of the wolf are considerably shorter than those of the dog, evidently marking him as an animal of more strictly carnivorous habits. The orbits are placed higher and more forward in the skull. The proportion between the bones of the hind legs differs; so does the number of toes. The structure of the teeth is different, these being in the wolf much larger, and the molar teeth of the upper and under jaw being adapted to each other, in the wolf, in a peculiar *scissors*-like manner, rendering them infinitely more serviceable for breaking bones—a structure not found in the dog.

"The wolf is not 'susceptible of the *highest degree of domestication*, and capable of great affection for mankind, which has been abundantly proved of the dog.' When has it been proved? I have seen many so-called 'tame wolves,' but never one that might be trusted, or that did not, when opportunity offered, return to his fierce nature and wild habits. The whelps, too, produced by these partially *domesticated* wolves, are not in the smallest degree influenced by the domestication of their parents. The Royal Zoological Society of Ireland had, some years ago, in their gardens in the Phœnix Park, a pair of very tame wolves. These produced young, which became tame likewise, and, in their turn, produced cubs. The society very kindly presented me with one of the last-mentioned cubs, which, though only five weeks old when I took him from his dam, was as fierce and violent in his own little way as the most savage denizen of the forest. I brought up this animal among my dogs; for

them he conceived a considerable degree of affection, or respect perhaps, for *submission* was the most striking feature of his conduct towards them, and was, doubtless, induced by the frequent and substantial castigations he received. He never, it is true, exactly dared to attack me in front, but he once showed a disposition to do so, when I pulled him down by the tail as he was endeavouring to get over the garden-wall. He, however, on several occasions charged at me from behind, when he thought my attention was otherwise engaged. He once only succeeded in inflicting a severe bite; and as by this time I had utterly despaired of making anything of him,—he was about eighteen months old,—I sent him about his business. He subsequently fell into the hands of a showman, and assumed his proper character in the caravan.

"How does it happen that the dog is to be met with in every quarter of the globe to which man has penetrated, while the true wolf has never yet been met with south of the equator? Further, are not several distinct species of wolf admitted to exist? Is there not more than one distinct species of wolf admitted by naturalists to exist in North America alone? It has not even been attempted to be proved that these species are identical; their distinctness has been more than tacitly admitted. Yet they resemble each other far more closely than any wolf does the dog. Has the dog, then, been derived from each and all of these wolves; or has the original wolf, origin alike of wolf and dog, been yet properly indicated? Should not this fact be duly ascertained prior to that in question?"

In a note to his translation of Cuvier's "Regne Animal," Mr. Blyth thus expresses his opinion respecting the domestic dog's origin:—

"If the idea, which I conceive there is every reason to entertain, respecting the origin of the domestic dog be well founded, it is clear that a recurrence to a single wild type would be impossible. The dog is apparently a blended race, derived principally from the wolf, and partly from various other allied species. In the Museum of the Zoological Society of London, there is a specimen of an Esquimaux dog (*C. nubilus*), which resembles the large American wolf so closely, that there can scarcely be any doubt of the connexion which subsists between them; and it is well known, of the American wolves in particular, that if a young animal be surprised by a hunter, and suddenly menaced by his voice and manner, it will crouch to him and implore his mercy in precisely the manner of a spa-

niel; so that only a little encouragement and kindness are required to gain its permanent attachment; indeed many of them are killed to obtain a proffered reward, by taking this (assuredly unworthy) advantage of their natural submissiveness. That the wolf possesses the mental qualities, and is capable of the same strong attachment to man as the most faithful dog, has been abundantly proved by the observations of M. F. Cuvier and others; and the unremitting persecution to which it has been necessarily subjected in Europe, for so many years, will sufficiently account for the savage and distrustful character which it exhibits when unreclaimed; though even then the germs of a better disposition are traceable in the permanent attachment of the male and female, and sociality of the young, till urgent necessity, or the annual period of dominant sexual excitement, subdues every milder propensity and acquired sentiment of friendship or disinterested affection. Instances occasionally happen of the dog returning by choice to a state of wildness, and assuming then, of necessity, the character ascribed to the wolf. I have known this to occur in a male pointer, and in a female greyhound: the latter was so fine a specimen of the breed, that on being entrapped, it was thought desirable to obtain a litter from her, which was accordingly effected; but while her puppies were very young she managed to escape to the woods, and never returned. Three of her progeny grew to be excellent hounds; but two others proved quite irreclaimable, and, escaping from servitude like their dam, were finally shot for their destructive propensities."

Some naturalists take the jackal as the dog's progenitor, and others, to account for the numerous species, suggest that the breed of jackals and wolves may be mixed in some of the domestic races with that of the original dogs. Dr. Hunter proved beyond doubt that the wolf and the jackal will breed with the dog; but he had not sufficient data for coming to the conclusion that all three were identical as species. In the course of the doctor's experiments it was ascertained that the jackal went fifty-nine days with young, whilst the wolf went sixty-three days.

It would be useless, however, to proceed further into the controversy. On either side the argument is equally strong that victory has not yet been declared for one or the other, and after all we are compelled to take the dog as we find him; and let his antecedents be what they may, he is none the less worthy our everlasting respect and admiration. "The whole

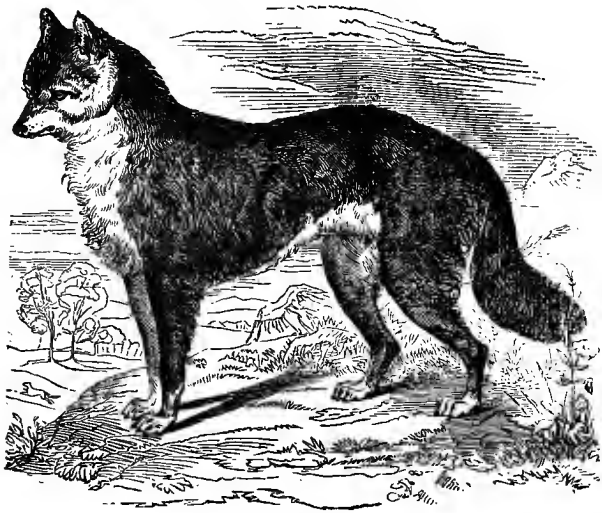
species is become our property; each individual is entirely devoted to his master, adopts his manner, distinguishes and defends his property, and remains attached to him even unto death; and all this springs not from mere necessity nor from constraint, but simply from true friendship. The swiftness, the strength, and the highly-developed power of smelling of the dog, have made him a powerful ally of man against the other animals, and were perhaps necessary to the establishment of society. It is the only animal that has followed man all over the earth." And all this since that remote period when the Israelites were captives in Egypt, and when it was recorded in sacred Scripture, "But against Israel shall not a dog raise his tongue."

That this animal has ever been held in the highest esteem in all countries except the East, requires but little research to prove. The ancient fire-worshippers of Persia recognized the dog as the "good principle," by which they were enabled to resist the assaults of the evil powers. They symbolized Ormord, their god, in the form of a dog; for, to a nomad race, there is no animal so dear, no type of a divine watchfulness so true, as the protector of the herd. A thousand lashes was the punishment for maiming any able dog, and it was a capital offence to kill one. The sight of a dog by dying men was said to comfort them with bodings of the conquest of all evil, and of their immortal peace. In later times, the Persians held it to be a good token for the dead, if a dog approached the corpse and ate from between the lips a bit of bread that had been placed there; but, if no dog would approach the body, that was held to be a sign of evil for the soul.

Among the old Franks, Suabians, and Saxons, a dog was held in small esteem; nevertheless, and, indeed, for that cause, he was not seldom set over the highest nobles of the land. If a great dignitary had, by broken faith, disturbed the peace of the realm, a dog was put upon his shoulder by the Emperor. To carry a dog for a certain distance was, in the time of Otto the First, and after it, one of the severest punishments inflicted on unruly prisoners. Nobles of lower rank carried, instead of the dog, a chain; peasants, a plough wheel. The Peruvians both worshipped the dog and ate it at their most solemn sacrifices. According to Kaempfer, the Japanese regard the dog with religious awe. Among ancient as well as modern Britons, the dog was an honoured companion. *Cu*, in the ancient British language, signified a dog, and among the ancient mighty Bri-

tish chiefs are found Cunobelin and Canute. Of the opinion of modern poets respecting the faithful animal we are aware; and that he was equally esteemed by poets of old Virgil attests:—

"Nor, last, forget thy faithful dogs: but feed
With fattening whey the mastiff's generous breed,
And Spartan race, who, for the fold's relief,
Will prosecute with cries the nightly thief,
Repulse the prowling wolf, and hold at bay
The mountain robbers rushing to the prey.
With cries of hounds thou may'st pursue the fear
Of flying hares, and chase the fallow deer,
Rouse from their desert dens the bristled rage
Of boars, and beamy stags in toils engage."



THE DINGO.

VARIETIES OF THE DOG.

WILD DOGS.—THE DINGO.

ONE of the most remarkable of this genus is the Australian dog, or Dingo. It is described as of wolf-like appearance, and standing when erect about two feet in height, and measuring two and a half feet in length. The head is formed much like that of the fox, the ears short, and with whiskers from one to two inches in length on the muzzle. The general colour of the upper parts pale brown, lighter under the belly. The hind part of the fore legs and the fore part of the hinder ones are white, as are all the feet; the tail is of a moderate length and somewhat bushy, but in a less degree than that of the fox. "It has," says a recent writer in reference to a female of the species, "much of the manners of the dog, but is of a very savage nature, and not likely to change in this particular. It laps like other dogs, but neither barks nor growls when teased; instead of which it erects the hairs of the whole body like bristles

and seems furious; it is very eager after its prey, and will eat rabbits or chickens raw, but will not touch dressed meat. From its fierceness and agility it has greatly the advantage over animals of superior size; a very fine French dog being put to it, it at once seized it by the loins, and would have soon put an end to its existence had not help been at hand. With the utmost ease it can leap over the back of an ass, and was very near worrying one to death, having fastened on it so that the creature was unable to disengage himself without assistance."

A high degree of organization is observable among the dingoes. They form into packs, and each pack takes an allotment of country and keeps to it, never interfering with another. So formidable were the ravages committed by these savages on the flocks of sheep and lambs of the early colonists, that it was found necessary to band together for mutual protection; an arrangement, the policy of which will at once be seen, when, as was proved at the time, twelve hundred sheep and lambs were seized and devoured in the space of three months.

The dingo's tenacity of life is extraordinary. Instances have occurred where it has been overtaken and clubbed till it lay an inanimate mass—as an observer might suppose mere amalgamated flesh and bone cased in dog-hide. Scarcely, however, have its triumphant beaters turned their backs, when the dingo, opening an eye at a time to see that the coast is clear, gets up and limps home. Mr. Bennet, in his "Wanderings," mentions the case of a dingo that, supposed to be dead, was carried to a tent to undergo the process of flaying, and actually suffered the skin to be cut from one cheek before he wriggled to his feet and scampered off.

THE HUNTING DOG, OR "WILD HONDEN."

This animal, which would seem to be a connecting link between the dog and the hyæna, is a native of Southern Africa. Its general colour is reddish or yellowish brown, marked at intervals with large patches of black and white. The nose and muzzle are black, and the central line of the head is marked with a well-defined black stripe, which reaches to the back of the head. The ears are extremely large, and covered with short black hairs. From their inside edge arises a large tuft of long white hair, which spreads over and nearly fills the cavity of the ear. They hunt in packs, and when in pursuit of game are very wolf-like in their behaviour, and for a wonderfully long period maintain a long-strided leisurely gallop.

Their females bring forth their whelps in holes and underground burrows.

They have three different cries, each being used on different occasions. One of these cries is a sharp angry bark, usually uttered when they behold an object they cannot exactly make out; another resembles a number of monkeys chattering together, or men conversing with their teeth clashing with cold. This cry is emitted at night, when large numbers of them are together, and they are excited by any particular occurrence, such as hearing the voice of the domestic dog. The third cry, and that most commonly used among them, is a sort of rallying note to bring the various members of the pack together.

They hunt in packs, fifty or sixty strong, the leading hounds, when fatigued, falling in the rear, while others, who have been "saving their wind," take their place, and the entire troop, inspired anew, utter their appalling yell and lengthen their strides. Let the object of pursuit be what it may—eland, gnoo, or gemsbok—he will surely succumb to the dogged perseverance of the wild honden, and, being once brought to bay, the business is speedily settled. Now you have the panting and bedraggled antelope, helplessly contending against the death that awaits him in each of the fifty pairs of sanguinary jaws by which he is encircled, and within ten minutes not a trace of him, except it be a few of the larger bones—not a strip of skin, or a scrap of flesh, or a smear of blood—all vanished, and nothing to betoken the tragedy lately performed but a posse of blinking, weary, pot-bellied "hondens" lying here and there.

Should the huntsman approach a horde of these wild dogs, nothing of the fear displayed by other carnivorous animals is apparent. They will merely emerge from their holes or rise from the ground on which they are reclining, yawn, shake themselves, and slowly make off, stopping at every few steps to look back, as though not quite sure that the intruder is an enemy, and inclined to parley with him. But against the hunter's dogs they bear the deadliest animosity, seeming to regard them as renegades and voluntary slaves, deserving the hatred of every free cur in the country. Singly, however, the "wild honden" would be no match against the trained hunting-dog, and with this fact the former seems to possess an instinctive knowledge, and is never rash enough to forget. Should the hunter or the Boer, whose defenceless flock has been ravaged, loose his watch-dogs and urge them to combat with the "honden," the latter will not budge an inch, lest, in the

flight, one of these weak creatures may fall in the rear and come to grief. Steadily they keep their ground, and when the avenging farm-dogs approach, open on either side to admit them, and then as suddenly closing up again, tear them limb from limb, and, devouring their carcasses, trot off merrily.

THE DHOLE.

The Dhole, or Kholsun, inhabits the western frontiers of British India. Its colour is bright bay, deeper on the muzzle, ears, feet, and tip of tail, than elsewhere. It is under two feet in height, and rather slim in build. It is a very shy animal, abiding in the depths of the jungles, and never venturing near the abode of man.

Like the other wild dogs it forms packs, and hunts down its game, both large and small. The dhole is a brave dog, and has no fear even of the terrible tiger. "From the observations which have been made," writes a naturalist, "it seems that hardly any native Indian animal, with the exception of the elephant and the rhinoceros, can cope with the dhole; that the fierce boar falls a victim, despite his sharp tusks; and that the swift deer fails to escape these persevering animals. The leopard is tolerably safe, because the dogs cannot follow their spotted quarry among the tree-branches, in which he fortifies himself from their attacks; but if he were deprived of his arboreal refuge, he would run but a poor chance of escaping with life from his foes. It is true, that in their attacks upon as powerfully armed animals as the tiger and the boar, the pack is rapidly thinned by the swift blows of the tiger's paw or the repeated stabs of the boar's tusks; but the courage of the survivors is so great, and they leap on their prey with such audacity, that it surely yields at last from sheer weariness and loss of blood."

THE BUANSUAH.

This animal, found throughout Northern India, in habit closely resembles the dhole. Like the latter animal, it is shy, bold, and hunts in packs. Unlike the dhole, however, it is capable of uttering a sort of bark, which, though quite distinct from that of the domestic dog, can be described by no other term. It is a bulkier dog than the dhole. When captured during its puppy-hood, the buansuah may be trained to obey its keeper, to help him in the chase, and to come and go at command. Having, however, succumbed to one human being, the animal evidently regards it as by no means a natural son-

sequence that he is to be regarded by the community at large as a tame dog. The individual who has tamed him is welcome to his services; but to the rest of the world he is a wild dog still, and willing to substantiate the title against any one rash enough to dispute it. For this reason, it would seem improbable that the buansuah will ever be numbered among *canis familiaris*.

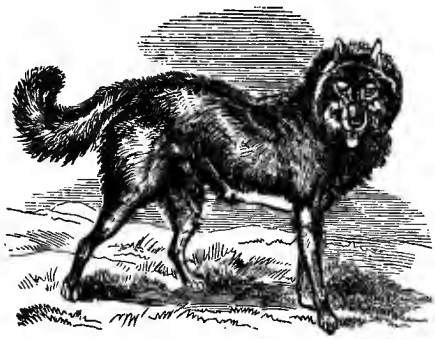
There exist in different countries animals of the dog species that, while they may repudiate utter savagery, cannot claim to be considered as domesticated. Among these may be classed the Asiatic street dogs, that possess no inconsiderable semblance to the wolf, both in appearance and habit. These dogs are not at all scrupulous about attacking a lone man, should the sun be down and all snug and quiet. It is said that these pariahs divide into bodies, and, portioning the city into lots, each body keeps to its own ground. Should a dog of one body pass the boundary and trespass on the ground of another body, he will infallibly be fallen on and devoured. A modern writer relates, that not long ago a traveller, who was well accustomed to the East, was rather in a hurry, and took a short cut through some bye-way. As commonly happens, the short cut proved a very long one, for a number of these dogs, resenting the intrusion of a stranger on their particular territories, immediately assaulted him. He was forced to stand at bay with his back against a wall, exerting all his energies, to the discomfiture of the leader of the pack, a ferocious-looking cur, scarred in all parts of his body by the numerous battles in which he had been engaged. In this position he waited until help arrived, and took this as a warning never again to go by a short cut in an Oriental city.

Among the North American Indians, hordes of semi-savage dogs prowl in the neighbourhood of the tents, literally snatching a living from the cooking-pots and offal cast out by the natives. Although, however, the Indian will not feed his dog, he has not the least objection to feed *on* him; in fact, dog-flesh is considered a delicacy, and one that is never missing from the board whenever an extraordinary feast is in progress. The manner of conducting these dog-meat orgies is peculiar. In one of them, the liver of the dog is tied to a pole, and the savages, gorgeously attired in feathers and red and yellow ochre, perform a sort of maypole dance round it, each dancer snatching with his teeth a little bit of the liver, until the last morsel is consumed.

One of their religious ceremonies has dog's-meat attached to

it. The Rev. J. G. Wood thus describes it. "There is a very peculiar god of the Indians who is always hot when the weather is cold, and cold when the weather is hot. He then has to be worshipped in his own peculiar fashion. The worshippers dress themselves in long pointed caps, not unlike those worn by the unfortunate wretches under the power of the Inquisition. They then kindle a large fire, and hang over it a cauldron containing dog's-meat. While the water is boiling they perform a mystic dance, and when it is bubbling up most furiously, each, as he passes, dips his hand in the boiling water, and exclaims, 'How cold it is!' The next time that the circuit is completed, the same process is repeated; but this time each one throws the boiling water over his naked shoulders, again exclaiming, 'How cold it is!' After some time consumed in these ceremonies, the meat is supposed to be thoroughly boiled. Each then takes a piece of the scalding meat out of the pot and swallows it, again exclaiming, 'How cold it is!'"

"There are no wild dogs in Ceylon," writes Tennent, "but every village and town is haunted by mongrels of European descent, who are known by the generic description of *Pariahs*. They are a miserable race, unacknowledged by owners, living on the garbage of the streets and sewers, lean, wretched, and mangy, and if spoken to unexpectedly, shrinking with an almost involuntary cry. Yet in these persecuted outcasts, there survives that germ of instinctive affection which binds the dog to the human race, and a gentle word, even a look of compassionate kindness, is sufficient foundation for a lasting attachment. The Singhalese, from their aversion to taking away life in any form, permit the increase of these desolate creatures, till, in the hot season, they become so numerous as to be a nuisance; and the only expedient hitherto devised by the civil government to reduce their numbers, is, once in each year, to offer a reward for their destruction, when the Tamils and Malays pursue them in the streets with clubs, and the unresisting dogs are beaten to death on the side-paths and doorsteps where they have been taught to resort for food. Lord Torrington, during his tenure of office, attempted the more civilized experiment of putting some check on their numbers by imposing a dog-tax, the effect of which would have been to lead to the drowning of puppies; whereas there is reason to believe that dogs are, at present, *bred* by the horsekeepers to be killed for the sake of the reward."



THE ESQUIMAUX DOG.

The sledge-drawing Esquimaux dog can be regarded as little less than a canine barbarian. Despite its long hair and bushy tail, it has the oblique eyes and elongated muzzle of the wolf. It is not a large dog, measuring but twenty-two inches from toe to shoulders. Yet the work it is compelled to do is dreadfully heavy, six or eight of them attached to a heavy sledge frequently accomplishing sixty miles a day, for several days in succession. The Esquimaux is, as a rule, as untamed a savage as his dog; so it may be easily understood that there occasionally occurs a roughish tussle between the reasoning and unreasoning brute. Says Mr. Hooper, in his "Tents of the Tuski," "When ordinary modes of chastisement have failed, the proceedings then instituted are very curious indeed. The driver gets off his sledge, seizes the dog which has misconducted himself, and makes a nice little hole in the snow, in which he arranges the unfortunate wretch's nose with the greatest care and attention to its suitable position. Having thus made due preparations, he pounds away at the snout of his victim with the butt-end of his whip, which is generally a piece of heavy flat ivory, in the most remorseless manner. I used at first, particularly on viewing this novel punishment, to be under great fear that the noses of the poor beasts must inevitably be broken or crushed; but no such consequence ensued, nor had our remonstrances any effect. If the snow was too soft for the purpose (of forming a ledge on which the dog's nose might be rested), the driver's foot was

substituted. The dogs do not make any noise while they are receiving the dreadful punishment, and only make an occasional short yell as they run away when they are released."

DOMESTIC DOGS.

Compared with what they were at a no more remote period than when our parents were little girls and boys, the present are piping times for dogs. Less than fifty years ago a man might with impunity train and educate dogs to the end that they might, by way of public show, maul and tear each other to death. The brutal pastime may not have flourished under the open gaze of the law, but flourish it did, and if the law discovered it, it merely winked. Less than fifty years ago, it was a common thing to see dogs harnessed to vehicles—to hawkers' vans, to costermongers' trucks, and to dog's-meat barrows. I think this practice has not been abolished more than twenty years; at all events, I, who am barely aged thirty, have a distinct recollection of enjoying the acquaintance and friendship of an old gentleman who hawked brushes and brooms about the country, and to whose large light van were harnessed four tremendous shaggy dogs. Wonderfully strong these dogs must have been. As for the van and the stock, they could wag their tails while they ran away with it; and even when their good-natured master invited a few stout boys to have a ride, their speed never relaxed to anything short of a comfortable trot.

Amongst the doggy reminiscences of my childhood, there is one other of an unlucky old brown dog that used to draw the cat's-meat barrow of an old woman, who supplied food to the feline of our district. As might have been expected, the barrow was ordinarily attended on its "rounds" by at least three or four hungry vagabond curs, ever watchful for a chance to crib a tempting mouthful when the old woman turned her back to serve a customer. The brown dog in the shafts was evidently conscious of the peril of the stock behind him, and yet was so helpless to avert it, that it was only by swiftly "backing" the barrow that he could ever get a bite at the lurking villains. One among the hungry ones gave more trouble to the brown dog than any other. This was a lank, short-cropped animal, of a sort of mixture of common street-cur and Scotch terrier, with perhaps a dash of Punch and Judy breed. He was the bane of the brown dog's barrow-life. He would run under the barrow and bite the brown dog's heels;

he would carry every scrap he could filch from the barrow and coolly devour it before the eyes of the outraged quadruped. One day he served him a trick that eclipsed all his previous impudence. There were four rearward vagabonds on this occasion, and it being Monday, the old meat-woman was detained somewhat longer than usual at the area gates, collecting her weekly bills. The four brigands, led by him of the mixed breed, trotted behind the barrow, stopping when it stopped. Presently the old woman, having carved a cat's dinner, went to deliver

it, leaving a substantial slice on the cutting-board. This evidently was the opportunity the mixed-breed (who I have not the least doubt planned the whole trick) had been watching for. Rearing on his hind legs he seized the slice, and, instead of retreating with it, carried it to within three yards of the brown dog's face, where he stood with it in his mouth in the most daring way, and wagging his tail defiantly. For a moment the brown dog seemed stupefied. That the mixed-breed had obtained the meat dishonestly was not for a moment to be doubted. Giving a tremendous growl, and forgetful of his burden, the faithful fellow set off after the thief, who, being

light and lean, found no difficulty in keeping a-head. So the chase continued for about a quarter of a mile, when the wheels of the barrow encountered a stone, and the vehicle was capsized on the spot. Now was the mixed-breed's chance. By a sudden wheel he doubled on the pursuing brown dog, and in another moment had selected a choice piece from the spilt treasure, from which his three confederates had already helped themselves.

It was a common thing in those days to see dogs harnessed to carts belonging to bakers, butchers, cat's-meat vendors, and costermongers of all grades. And when the week's work was over, the proprietors of the said animals went out on little excursions to Richmond, Kew, and other favourite Cockney holiday resorts, on the Sunday, for a "treat." Kind, hospitable "costers" would invite a select party of friends, and decorate their barrows and dogs and themselves in gay style, and then drive out for a day's holiday. Great excitement sometimes was occasioned by a race between the dogs of these worthies, the poor brutes, in their eagerness to serve their masters, often outstripping the mail-coach.

Such proceedings naturally called forth much sympathy for the overworked dogs, and several philanthropic persons did their utmost to put a stop to them. Representations were made to the "Society for the Prevention of Cruelty to Animals," and that institution prevailed on a Mr. Hawes to endeavour to obtain some legal interference. That kind-hearted gentleman brought a bill into the House of Commons for the abolition of London dog-slavery. Whether the "House" at that time was so dreadfully in want of a question that this canine one was at once eagerly caught, or that "emancipation" in all guises and shapes was acceptable to the British public, I am not prepared to state. Certain it is, however, that with more zeal than judgment the bill was passed, making it illegal to use the dog as a beast of burden. No provision was made for the maintenance of the emancipated canine "niggers" of London. Nevertheless, great were the rejoicings of those who influenced the passing of the bill, and "they commemorated the event by a picture representing the dogs in council,—the president, a mastiff, reading the Act, while a terrier stood ready, document in paw, to move a vote of thanks to Mr. Hawes. In the distance a procession of costermongers, &c., was seen drawing their own carts, while the emancipated dogs were looking on, laughing at them."

But, alas! the shortsightedness of politicians, and the mis-

guided generosity of philanthropists, had provided a remedy which (so far as the dogs were concerned) was a hundred times more lamentable than the evil itself. Let the reader imagine an edict being passed to-morrow, prohibiting the application of manual labour to all the donkeys in London, and he will at once get an idea of the result of the above Act in relation to draught dogs. The interesting question probably never occurred to the ingenious Mr. Hawes and his colleagues:—what is to become of the animals thus precluded from earning their maintenance? An indulgent master here and there, perhaps, pensioned his old canine servant, but what became of the majority of the less fortunate ones? A creditable authority says:—"We saw, one morning, upwards of fifty of them being drowned in the Surrey canal." Indeed, on the very next day that the Act was passed, hundreds of these fine muscular animals, some of them nearly as large as young donkeys, were hung, shot, stoned, drowned, or otherwise put to death; and within a month, there was scarcely one of these useful dogs to be seen in the streets of London.

To return, however, to the dog-working question. It was not only as a beast of draught that the animal was employed. Before the invention of that useful roasting apparatus the "smoke-jack," there was attached to all kitchens where much meat was cooked a couple of long, low, bandy dogs, known as "turn-spits." At one end of the meat-spit was fastened a long wooden cylinder with bars on the inside to secure foothold. Into this wheel one of the dogs was put, and there he trod with a walking action, which spun the cylinders and consequently the spit round. The two dogs worked in spells of say fifteen minutes each, and sure as the clock, if the "relief" did not make his appearance at the end of a quarter of an hour, his mate would either stand still and refuse to go another round, or else he would leap out and hunt for the skulker. Singularly enough, and as though they were fit to turn a meat-spit and for nothing else, since the invention of modern cooking appliances the turnspit-dog has been gradually vanishing from amongst us. As says the Rev. J. G. Wood: "Just as the invention of the spinning-jenny abolished the use of distaff and wheel, which was formerly the occupation of every well-ordered English cottage, so the invention of automaton roasting-jacks has destroyed the occupation of the turnspit-dog, and by degrees has almost annihilated its very existence. Here and there a solitary turnspit may be seen, just as a spinning-wheel

or a distaff may be seen in a few isolated cottages; but both the dog and the implement are exceptions to the general rule, and are only worthy of notice as curious relics of a bygone age."

As before observed, the "good time" for dogs has arrived. In the days of their oppression and servitude, the advent of a "day,"—that is, a day of uncontrolled liberty and freedom of action,—was a circumstance of such rare occurrence that only one such could be—according to the old proverb—guaranteed to each dog in the course of its existence. Now, however, every dog has not only his "day," but all the days of his life. Gaol is the doom of the man who sets dogs to fight each other. Should he set the biggest mastiff to draw even so light a thing as a perambulator, the same fate will inevitably overtake him. Acts of Parliament have been made rendering him an article to purloin which is a transportable offence; and that he may not, when lame, and grey, and useless, die, as did his forefathers, in a ditch, a hospital has been established at the north of London, where night and day patients are admitted without inquiry or recommendation.

THE THIBET MASTIFF.

We will begin with this dog, not only because he is one of the largest, if not the largest, dog in the world, but because he, standing alone among his tribe, holds Europeans in the utmost detestation: a white face at once rouses the Thibet's ire as effectually as a rat displayed to a terrier. He may be a very good and faithful animal, but still the last-mentioned fact is not of a pleasant character, and the sooner he is dismissed the better.

Speaking of the Thibet dog, Mr. Broderip observes: "These noble animals are the watch-dogs of the table-land of the Himalaya mountains about Thibet. Their masters, the Bhoteas, to whom they are most strongly attached, are a singular race, of a ruddy copper colour, indicating the bracing air which they breathe, rather reserved, but of an excellent disposition. The men till the ground and keep sheep, and at certain seasons come down to trade, bringing borax, tinctal, musk, &c., for sale. On these occasions the women remain at home with the dogs, and the encampment is watched by the latter, which have an almost irreconcileable hatred to Europeans, and generally fly ferociously at a white face." They are of a black colour, with a tawny patch over each eye. Their skin seems to hang loosely,

and their upper lips are curiously pendulous. Several of these animals have been brought to England, but in almost every instance they have in the course of a short period either dwindled to a miserable condition or died outright. No other climate but the very coldest seems to agree with the Thibet dog.

THE BULL-DOG.

This creature, next to the game-cock, bears the reputation of being the most courageous animal in the world. In one respect he is decidedly the game-cock's inferior, for whereas to whatever part of the world the latter combination of pluck and feathers be carried, it remains dauntless as ever, the bull-dog in India is the merest cur, fit only to loll its tongue and lie in the shade.

The shape of the bull-dog is somewhat remarkable. "The fore-quarters are particularly strong, massive, and muscular; and the chest wide and roomy. The hind-quarters, on the contrary, are very thin, and comparatively feeble. All the vigour of the animal seems to settle in its fore-legs, chest, and head. The little fierce eyes that gleam savagely from the round combative head, have a latent fire in them that gives cause for much suspicion on the part of a stranger who comes unwarily within reach of one of these dogs. The underhung jaw, with its row of white glittering teeth, seems to be watering with desire to take a good bite at the stranger's leg; and the matter is not improved by the well-

known custom of the bull-dog to bite without giving the least vocal indication of his purpose."

The notion that the bull-dog is by nature a dull and brutish animal is wide from the fact. As he occasionally makes his appearance before us he is stolid and hideous enough, in all conscience. But it must be borne in mind that this is not the true bull-dog; this is a creature taught and trained, or what is worse, whose great grandfather was taught and trained only to fight its kind, and to pin bulls. It is housed to this end, and fed and educated to it. No other canine animal has so little liberty. It is fettered to its dismal kennel in many ways in which other dogs are exempt. It is preparing for a "match," and must, therefore, be kept quiet; it is recovering from a "match" (look at its poor throat and ears), and must not leave the kennel for a moment. Even when neither of these causes of imprisonment exists there are two others that are as firmly attached to it as its own tail. It is dangerous to let it out—it might bite somebody: it is impolitic to let it out, as it is an animal of choice breed, and to let it run with common street dogs might spoil its manners at the very least. So it is kept a prisoner; a surly savage, feeding—not too heartily—on raw meat, with an occasional bone to whet its fangs on while it cogitates its last battle and battles to come. A pretty specimen of humanity a *man* would turn out if he were subjected to similar treatment. Goodness knows, with liberty allowed him, when his mind is fully bent on fighting—when he deliberately steeps himself in blackguardism, and studies the trade of prize-fighting as a means of existence, a man converts himself into no mean likeness of the jowled brute.

As has been truly said, "the bull-dog ranks as an entirely artificial creation. In proof of this stands the well-known fact, that unless the breed be sedulously kept up, it is apt to degenerate, or to become extinct. Old breeders even now say, the ancient kind of English bull-dog is nowhere to be found. But take another proof. We want no anatomical knowledge or prejudice: in him formation is to be judged. Look at the head of the animal. Is not the cranium a malformation? Do not the habits of the animal prove it to be a pampered creation? It is not generally known, that the disposition of the genuine bull-dog is too fond. It will fondle upon any stranger; and yet, contrary to the general custom of its race, it displays small preference for its master. It will fondle a human being as though its heart would burst with affection; but upon the

slightest excitement—often upon a sudden sound—it will fly at and mangle the hand that was caressing it. Then the hold taken by this animal is more retentive, that is, strictly natural. It will fix upon an object, and frequently suffer itself to be dismembered before it will let go its hold, although its master's voice be energetically raised to command it. Do not these traits bespeak the being formed rather by man's malice, than created by Nature's goodness? Look at the likeness of the beast, and say how far it resembles the mild, graceful, and generous race to which it outwardly belongs."

According to Stonehenge, to be well-bred, the bull-dog should present the following characteristics: "The head should be round, the skull high, the eye of moderate size, and the forehead well sunk between the eyes; the ears semi-erect and small, well placed on the top of the head, and rather close together than otherwise; the muzzle short, truncate, and well furnished with chop; the back should be short, well arched towards the stern, which should be fine and of moderate length. Many bull-dogs have what is called a crooked stern, as though the vertebræ, or tail, were dislocated or broken. I am disposed to attribute this to ill-breeding. The coat should be fine, though many superior strains are very woolly-coated; the chest should be deep and broad, the legs strong and muscular, and the foot narrow, and well split up like a hare's."

There is scarcely a sporting dog in Europe into whose blood has not been imported some of that of the bull-dog. It is not only as a fighter that the animal excels. Perseverance is as much its characteristic as pugnacity, and many a time it has easily beaten another dog in a feat supposed to be its antagonist's speciality. For instance, a bull-dog was lately matched by its owner to *swim* a match against a large Newfoundland dog. The owners of the competing quadrupeds threw them out of a boat at a given signal, and then rowed away as fast as possible. The two dogs followed the boat, and the bull-dog won the given distance by a hundred yards. It was remarked that while the whole of the Newfoundland's body was submerged, showing only the upper part of his head above the surface, the whole of the bull-dog's head and its neck were visible the whole distance.

THE CUBAN MASTIFF.

This animal is supposed to be a cross between the true English mastiff and the bloodhound. The aversion to white

folks, that distinguishes the Thibet dog, is in this case exactly reversed, if not by nature, at least as far as the teachings of brutal men may prevail. Sometimes this mastiff is called the "Nigger" hound, a term the application of which will render any explanation as to this dog's pursuits almost unnecessary. When, in reading slave romances or realities, the reader comes across a runaway-nigger hunt, he may bear in mind that the dog in question is the foremost brute in the chase. When the Spaniards invaded America, the ravages and blood-thirstiness of these creatures astonished the simple natives no less than the "thunder and lightning" of the Spanish arms.

THE ENGLISH MASTIFF.

This, the largest of the dogs indigenous to this country, is a creature whose chief characteristics might be emulated by not a few bipeds. In times of peace, and when not disturbed by a sense of responsibility, the huge fellow is just as mild as a kitten. No puppy is too young for him to try a game with; and should the waspish little brute turn and snap at his huge patron, he will merely blink his eyes good-humouredly and wag his tail, as though he thought it rather a good joke, or, better still, remembering his own strength, as an act of pluck on the part of the pigmy, and a thing he admired.

All this may happen in the daytime, when the sun is shining, and all men have their eyes open to watch over their goods. But stay till nightfall, when the mastiff "mounts guard" in the yard or warehouse. Then his whole faculties are his master's. In any one else's interest, or in his own, he has neither ears nor jaws nor limbs, and should his oldest canine chum approach with no worse intention than a gossip, he will be warned off surlily; if he comes any closer, he will be bit. His discrimination between friend and foe is seldom at fault, and even in cases that reasoning mortals would regard as a "fix," the mastiff manages sometimes to pull through cleverly.

My grandfather used to tell me a dog story illustrative of this. At the time in question he lived at Yarmouth, and had for a neighbour a tanner, whose manufacturing premises were close at hand. The tanner had a mastiff that guarded his yard by night. The tanner had a foreman, who lived with him many years—before the purchase of the mastiff, indeed. As the foreman was more about the premises than any one else, and as, moreover, it was his business to see that the dog was

regularly fed, the greatest good feeling existed between them. It happened, however, that the foreman's integrity was doubted, and he was summarily discharged, and another man taken on in his place.

It seemed that there was ample ground for suspecting the honesty of the old foreman; for, within a month of being discharged, he conceived the notion of robbing his late employer, by removing a cartload of hides in the night, he assuming that his intimate acqnaintance with the yard dog would protect him from difficulty in that quarter. So, in the dead of night, he drove his cart just under the walls of the tan-yard, and standing on the top edge of his cart, clambered to the top of the gate and dropped into the yard. The mastiff, instantly knowing the man, offered no resistance, nor in any way betokened his surprise at the nocturnal visit beyond following the visitor

about pretty closely. The hides were selected, and tossed, one by one, over the wall and into the cart; and then the thief, patting the dog's head by way of thanking him for his non-interference, began to scale the gate. This act, however, seemed to convince the dog that something must certainly be wrong; for although there might be a reason for climbing *in*, there could be no excuse for climbing *out*, when there was the gate, a touch at the bolt of which would give easy and proper exit; so, without troubling his head further about the matter, he seized the ex-foreman by the leg, and there held him till the arrival of the tanners in the morning.

The height of this animal is usually from twenty-five to

twenty-eight inches at the shoulder, and its weight above a hundred pounds. The shape of the mastiff breed is such as might be expected from a crossing of the bulldog and the bloodhound. Like the former, the under jaw is generally slightly protruded; but the teeth are constantly covered, as is never the case with the thorough-bred "bull." The mastiff's coat is smooth, and its most common colour light liver-colour, and different brindlings, with black and white patches

THE BLOODHOUND.

This dog with a dreadful name was, in ancient times, very common in England, and very commonly employed. Let not the innocent reader, however, imagine that *human* blood is the only sort this hound's nose is quick at scenting. They were chiefly used for the detection of sheepstealers, it being the common custom for the delinquent to slaughter the animals before conveying them away, that their carriage might be the easier. Little more than fifty years ago, however, we read of the Thrapston Association, who, "for the detection of felons in Northamptonshire, have provided and trained a bloodhound for the detection of sheepstealers. To demonstrate the unerring infallibility of this animal, a day was appointed for public trial; the person he was intended to hunt started, in the presence of a great concourse of people, about ten o'clock in the forenoon, and at about eleven o'clock the hound was laid on. After a chase of an hour and a half, notwithstanding a very indifferent scent, the hound ran up to a tree in which

he was secreted, at the distance of fifteen miles from the place of starting, to the admiration and perfect satisfaction of the large number of persons assembled."

The ancient mode of training a young bloodhound was to lead it, accompanied by an experienced old hound, to the spot whence a deer or other animal had been taken on a mile or two; the hounds were then "laid on" and encouraged, and after hunting this "drag" successfully, were rewarded with a portion of the venison which composed it. The next step was to take the young hound, with his seasoned tutor, to a spot whence a man, whose shoes had been rubbed with the blood of a deer, had started on a circuit of two or three miles; during his progress, the man was instructed to renew the blood from time to time, to keep the scent alive. His circuit was gradually enlarged at each succeeding lesson, and the young hound thus entered and trained, became at last fully equal to hunt by itself, either for the purposes of wood-craft or war.

A thoroughbred bloodhound stands about twenty-eight inches high, and is muscular, compact, and strong; the forehead is broad, and the face narrowed towards the muzzle; the nostrils are wide and well developed; the ears are pendulous and broad at the base. The general aspect of the hound is one of self-possession and sagacity. Its voice is deep and sonorous, and may be heard at a very great distance. The colour of the true breed is said to be reddish tan, darkening gradually towards the upper parts, till it becomes mixed with black on the back; the lower parts, limbs, and tail, being of a lighter shade, and the muzzle tawny.

The only chance for either man or beast hunted by the bloodhound is to take to the water,—to start a jump three or four feet of the water's edge, and to leap far and fairly in. Water holds no scent; therefore, when the hound comes to the jumping-place, he will be puzzled, and double back on the track, and altogether become so confused as to be for the time useless. Should blood in any quantity be spilt on the tracks, the hound often refuses to proceed beyond it; and so it has happened in slave-breeding countries, that a runaway has purposely gashed his leg or arm, so that the ground might be saturated and further chase baulked.

The Cuban bloodhound has been already alluded to. It is certainly the most terrible of the family, including the African species. Here is an anecdote of a Cuban hound told by Dallas:—"One of the dogs that had been unmuzzled to drink

when there was not the least apprehension of any mischief, went up to an old woman who was sitting attending a pot, in which she was preparing a mess. The dog smelled at it and was troublesome; this provoked her; she took up a stick and began to beat him, on which he seized her by the throat, which he would not leave till his head was severed from his body by his master."

THE STAGHOUND.

This now rare hound is said to derive its origin from the bloodhound and the greyhound—a mixture resulting in the most exquisite scent combined with great endurance. Of late years the sport of stag-chasing has in a great measure given place to fox-hunting; and even where the royal and ancient sport is still followed, the dogs employed are generally a large and powerful species of foxhound. These dogs, of which mention will be found in another page, rank among the swift and most enduring dogs in the world. They have been known to maintain, without flagging, a stag-chase of fifty miles' duration, and in old sporting chronicles may be found an account of a hunt of so protracted a nature that the whole pack of dogs excepting two fell off the trail, and that at last the huntsmen came up to their game dead from sheer exhaustion, and the two hounds within a short space dead too.

It is said, however, that the modern substitute, although equal in fleetness and strength to the old English staghound, is not its match for courage. It would seem at first sight that no particular amount of bravery was requisite to face the

"gentle" stag, but it should be remembered that that animal when brought to bay becomes a rather formidable opponent: its neck is curiously lith, its antlers sharp and hard as steel prongs, and its active hoofs by no means to be despised.

THE FOXHOUND.

There can be no doubt that the foxhound is one of the most highly-prized dogs in Europe. Palatial kennels are erected for its reception, and thousands of pounds spent every year with a view to the maintenance of its present excellence, with improvements if practicable. It is commonly agreed that the fox-hound originated with the ancient English hound, improved by judicious crossings. That the greyhound enters into its composition is pretty evident as it is one of the speediest of dogs. This was tested some years ago on the Beacon Course at Newmarket. "The length of the course is 4 miles 1 furlong and 132 yards, and this distance was run by the winning dog in eight minutes and a few seconds. The famous race-horse 'Flying Childers,' in running over the same ground, was little more than half a minute ahead of the hound. Now, if we compare the dimensions of the horse and the hound, we shall arrive at a tolerably accurate conception of the extraordinary swiftness to which the latter animal can attain. In that match no less than sixty horses started together with the competitors, but of the sixty only twelve were with the dogs at the end of the run."

Fox-hounds are kept with the severest discipline. At nome

it is customary to call them from the kennel by name, and one at a time when feeding-time arrives, and among a well-trained pack the circumstance of one dog answering to another's name, or one coming uncalled would be regarded as a heinous offence, and one that would certainly earn for the transgressor a tremendous thrashing. The result of this severe training is, that when in the hunting-field the foxhound will instantly obey the most hurried order or gesture of the huntsman.

The foxhound is not a particularly large dog, its average height being under two feet, and of proportionate length. The female is smaller than the male.

THE BOARHOUND.

This brave and valuable dog is the result of a careful blending of other species. To successfully overtake and assail so tremendous and savage a creature as the boar—concerning which one of the most eminent of modern Indian hunters, Captain Shakspear, says that, as dangerous game, it certainly ranks before the tiger and leopard,—to successfully meet this tusked monster three qualities are essential: first, speed; second, quick scent and swift action; and third, indomitable pluck. The first is supplied by the pure greyhound, and by crossing it with the English mastiff two of the three demands—speed and pluck—are met; for scent and quick movement, what better than the nimble, fiery terrier? With the latter, then, the progeny of the greyhound and the mastiff is crossed, and the result is the boarhound.

The reader may glean some notion of the sort of animal the wild boar is to face from the following summary that terminates one of Captain Shakspear's hunting narrations:— . . . "I have stated that the boar is the most courageous animal in the jungle. There he lay, with a broken spear in his withers, the shaft sticking up a foot and a half from the blade—knocking over a horseman and wounding his horse; receiving two bullets, ten to the pound—the first in the neck and throat, the second breaking his jaw, and fired within a few feet of his muzzle; making good his charge, cutting down his enemy like grass, wounding him, knocking over a second man armed with a spear, defying the dogs, and then, when in the act of charging, receiving a shot in the brain, and dying without a groan."

Boar-hunting is happily but a thing of the past in England. In other parts of Europe, however—in Germany, for instance—the dense forests still afford a stronghold to the "long-tusked

hog," and in that country boar-hunting is still a common sport, and the boar-hound generally bred for use. In appearance the dog in question is rather formidable; it is taller at the shoulders than the mastiff, the colour of which it usually assumes. The limbs are very stout and long, and the shape of the head, which is rather large, partakes of the squareness of the mastiff and the ferretty sharpness of the terrier. When the boar is brought to bay, it is the business of the hound so to manœuvre that the animal's attention shall be fixed on it while the hunter is left at liberty to attack.

THE NEWFOUNDLAND DOG.

This, the largest of the spaniels, is, as it deserves to be, one of the most favourite dogs in England. In its native land, however, whatever its deservings may be (it is just possible that, ruled by cruelty, he is not quite the model animal we find him), he is treated villanously. "He is converted into a beast of burden, and forced to suffer even greater hardships than those which generally fall to the lot of animals which are used for the carriage of goods or the traction of vehicles. The life of a hewer of wood is proverbially one of privation, but the existence of the native Newfoundland dog is still less to be envied, being that of a servant of the wood-hewer. In the winter, the chief employment of the inhabitants is to cut fuel, and the occupation of the dog is to draw it in carts. The poor animals are not only urged beyond their strength but are meagerly fed on putrid salt fish, the produce of some preceding summers. Many of these noble dogs sink under the joint

effects of fatigue and starvation, and many of the survivors commit sad depredations on the neighbouring flocks as soon as the summer commences and they are freed from their daily toils."

There are two kinds of Newfoundland dog. One is considerably larger than the other, measuring about two feet nine inches in height, while the smaller (sometimes called the Labrador or St. John's dog) rarely measures higher than two feet. The Newfoundland is evidently a water dog. Not only does he freely enter the unstable element at the least bidding, but if he should happen to live near the sea or a river, and can find a playfellow of his own kind, their swimming matches and aquatic gambols are a good thing to witness. No doubt this dog owes its swimming powers in a great measure to its broad feet and strong legs.

Its sagacity in assisting a drowning person is wonderful. It is not content with seizing any part of the person or dress and endeavouring to paddle shoreward; it will shift and shift its hold till it secures a grip on anything that may encircle the neck, and there hold on as though aware that as long as a man's head was out of the water no harm could come to him. On shore his intelligence is just as surprising. Take the following as a sample, on the undoubted authority of the Rev. J. G. Wood:—

"One of these animals belonging to a workman was attacked by a small and pugnacious bull-dog, which sprang upon the unoffending canine giant, and after the manner of bull-dogs 'pinned' him by the nose, and there hung in spite of all endeavours to shake it off. However, the big dog happened to be a clever one, and, spying a pailful of boiling tar, he hastened towards it, and deliberately lowered his foe into the hot and viscous material. The bull-dog had never calculated on such a reception, and made its escape as fast as it could run."

THE GREYHOUND.

This variety of dog is remarkable for its symmetry, speed, and keenness of sight. It is found throughout Europe and in parts of Asia, and would seem to have been a distinct variety of the dog from a very early period. In ancient times it was more valued even than now. To be the possessor of a greyhound was to be a distinguished person—a nobleman, or at least a gentleman. We find it recorded, that a fine paid to king John consisted of "500 marks, 10 horses, and ten leashes of grayhounds."

The perfection of greyhound form is well described in the following quaint lines:—

"Headed lyke a snake,
Neckyed lyke a drake,
Footed lyke a catte,
Tayled lyke a ratte,
Syded lyke a teme,
And chyned lyke a bream.
The fyrst yere he must learne to fide,
The seconde yere to fild him lide,
The thyrde yere he is felon lyke,
The fourth yere there is none syk,
The fifth yere he is goode ynough,
The sixth yere he shall hold the plough,

The seventh yere he will avayle
Grete bitches for to assayle ;
But when he is come to the ninth yere,
Have him than to the tannere ;
For the best hound that ever bytch had,
At the ninth yere is full bad."

Formerly the greyhound was principally employed in chasing the stag; in modern times, however, its use appears in the sport of hare-coursing. Swift as is the hare, the greyhound is swifter; and if the former ran in a straight line it would be overtaken in a very short space. The instincts of the hare, however, teach it better. Its fore legs being very short, it is enabled to turn an acute angle with little diminution of speed; whereas the long-limbed and impetuous hound finds it impossible to halt or make short turns at will, and so is carried beyond his mark, as it were, and has the chase to renew with a fair start for the hare. Should the latter once gain cover, it is tolerably safe, as the greyhound hunts solely by sight. Its muzzle is so narrow in proportion to its length, that the nasal nerves have no room for proper development, the result being that the animal's power of scent is very deficient.

The largest of the species is the Irish greyhound, which measures four feet in length, and is altogether rougher and sturdier than the English greyhound. Like all good dogs, it is peaceful enough when not angered or excited by the sight of game. When this latter is the case, its ferocity is terrible. In ancient times, when the Irish forests were infested by the wild boar and wolf, the hound in question was wont to do good service to its masters. There are very few of the genuine breed existing at the present day.

The greyhound peculiar to Scotland is a shaggier creature than the Irish one, but is not so large or so powerfully built. This is the dog towards which Sir Walter Scott evinced so much affection, and whose disputed intelligence and sagacity he was at such pains to vindicate. The Scotch greyhound, or deerhound as it is sometimes called, is used in the chase of hares and deer.

The Russian greyhound, which is smaller than the others, is used as a chaser of wild beasts, in which occupation he has an advantage over his English and Scotch brethren, inasmuch as he is gifted with the power of scent. Persia has its greyhound. It is of rather slender build, and its ears are "fea-

thered" spaniel fashion. It is bold, enduring, and marvellously swift. With its aid, the Persians chase that speediest of quadrupeds, the wild ass. It is used, too, against the antelope, and, though no match for that animal, is often enabled to overtake and pull it down, by what seems to fair-thinking folks rather a mean "dodge." The Persian antelope-hunters, besides the dogs, are provided with a trained falcon, whose business it is to hover about the antelope's head, and to flap its wings before its eyes, thus scaring the poor beast, and compelling it so to deviate from its proper course that the dogs are enabled to come up with it.

Last, but not least—that is, in the esteem of canine pet-keepers—comes the diminutive, delicate Italian greyhound. It derives its origin from the smooth old English greyhound, and is indeed the same animal dwarfed. Its sole value is as a "toy;" for although its speed is sufficient to enable it to overtake such small game as the rabbit, it would be too faint-hearted to seize it; or, even should it manage to screw its courage, too weak in the jaw to hold it. It dares not stir out on a cold day without an overcoat and mittens, and even then a shift of wind will give it ague.

The worst feature of Italian greyhound keeping is, that you are never sure of the value of your dog. Fashion is more constant even to ladies' bonnets than to this dog. This year it must be free from spots and of a uniform colour. Next year, to be perfection, it must be "starred" on the breast. It may be said, however, that golden fawn is a highly respectable tint for an Italian hound, and that white dogs and red dogs of this breed are held cheaper than any other.

THE HARRIER.

The description of the foxhound exactly applies to the harrier, except that the latter is five or six inches less in height. They derive their name from the circumstance that when hare-hunting was fashionable the dogs in question were used for the sport. The harrier is not so swift an animal as the foxhound. Beckford sums up the perfections of the harrier as follows, and what was written and accepted in 1779 is, singular to relate, endorsed by huntsmen of the present day: "Let his legs be straight as arrows; his feet round, and not too large; his shoulders back; his breast rather wide than narrow; his chest deep; his back broad; his head small; his neck thin; his tail thick and bushy—if he carry it well so much the better. Such

nounds as are out at the elbows and such as are weak from the knees to the foot should never be taken into the pack."

THE BEAGLE.

The beagle (the *bratch* of ancient times) is the smallest of our true hounds. In shape it is not unlike the harrier, but is heavier about the throat, and its body and limbs are stouter. The ordinary beagle measures about fourteen inches in height. The animal known as the rough beagle is supposed to be a cross between the original stock and the rough terrier. This opinion, however, is probably derived from the fact that its bark, which is sharp and shrill, more nearly resembles the voice of the terrier than any other, and that the quality of its hair and its whiskers resembles the terrier's. Some writers regard the rough beagle as a distinct variety. The smallest of the family is the dwarf or rabbit beagle. It is said that at the time of Queen Elizabeth there was a breed of these beagles so small that one might be hidden in a man's glove. Perhaps, however, his hawking-glove was meant; and although this would denote the dog to be marvellously little, a dog that could be squeezed into a modern "kid" would be a much *greater* novelty, as an Irishman might observe.

THE WATER-SPANIEL.

This animal is of moderate size, measuring about twenty-two inches in height at the shoulders, and proportionately stout in make. Its forehead is lofty, its nose fine, its ears, which when spread measure from tip to tip rather more than the dog's entire height, are deeply fringed. Its coat, which is close, curls over the body in crisp curls. General colour, brown. Its tail is not fringed, but covered with curly hair to the extremity. That the water-spaniel was known to the Romans is proved by the fact that his figure exists on many of their monuments.

No weather, be it ever so cold or boisterous, can daunt this water-loving species of the genus *canis*. Indeed, it is admirably formed for aquatic exercise. Its feet are very broad (webbed, it has been asserted, but this is an old woman's tale), and its coat is supplied with natural oil in such profusion that it never becomes saturated; as soon as the dog leaves the water, he gives himself a vigorous shake, and is at once dry. This waterproof quality of the water-spaniel, however, debars him the privilege of inhabiting the house, for should he happen

to come near the fire the human organ of smell is speedily and unpleasantly made aware of the fact.

There is another dog of aquatic habits, known as the Great Rough Water-Dog. It is about the height of a setter, but more stoutly built. His coat is long and curled, and its colour usually black and white, or brown and white. "I recollect," says Mr. Richardson, "a singularly large dog of this breed about ten years ago in the possession of Mr. Grierson, of North Hanover-street, Edinburgh, near the foot of the mound, which was possessed of unusual intelligence. Amongst other eccentricities, this dog followed the profession of mendicancy, and regularly solicited the charity of the passer-by. On receiving a halfpenny, his habit was, if hungry, to proceed at once to the shop of Mr. Nelson at the corner of Rose-street, and purchase a biscuit; but it sometimes happened that he put by his halfpence till the calls of appetite returned, and he would go to his repository, take the money to the baker and make his purchase. A servant of Mr. Grierson accidentally came upon this sagacious and provident animal's hoarding-place on one occasion, where were found about fivepence halfpenny in halfpence. The dog chanced to enter at the moment of the discovery, and, with a growl of displeasure, he moved to the spot, and, snatching up his wealth, proceeded at full speed to the shop, and dashed the money on the counter, barking vehemently at the same time, probably deeming it safer at once to turn his money into bread than risk being robbed by keeping it."

COCKER-SPANIEL.

This little spaniel, whose weight averages twelve or fifteen pounds, is a favourite sporting dog. There are several sorts: the "Welsh," the "English," the "Devonshire," and many others. Captain Williamson (author of "Oriental Field Sports") once experienced an instance of the indomitable courage of a tiny cocker of his, called "Paris." The captain was shooting near some underwood, rather thinly scattered among reedy grass, growing on the edge of a large water-course, which took its rise at the foot of the large hill at Mucknee Gunge (India), when suddenly the spaniel in question, one of a brace that was present, ran round a large bush greatly agitated, and apparently on some game which the sportsman expected to put up. The captain followed as fast as he could, but Paris was too quick for him, and before he could well get round to the bush, which was about ten yards from the brink of the ravine, had come to a stand, his ears pricked, his tail wagging like lightning, and his whole frame in a seeming state of ecstacy. "I expected that he had got a hare under the bank, and as the situation was in favour of a shot, I ran towards him with more speed than I should have done had I known that instead of a hare I should find, as I did, a tiger sitting on its rump, and staring Paris in the face. They were not above two yards asunder.

"As soon as the dog found me at his side, he barked, and, giving a spring down, dashed at the tiger. What happened for some moments I really cannot say; the surprise and danger which suddenly affected me banished at once that presence of mind which many boast to possess in all emergencies. However, as soon as my fright had subsided, I began, like a person waking from a dream, to look about, and saw the tiger cantering away at about a hundred and fifty yards' distance with his tail erect, and followed by Paris, who kept barking." The tiger, arriving at a thick cover, disappeared, and the plucky little cocker returned to his dismayed master.

THE LABRADOR SPANIEL.

This dog presents an appearance intermediate between the Newfoundland and the land spaniel. As a swimmer and diver he is almost unmatched. The Labrador spaniel may be considered in the light of a "public character." A number of *Saunders's News-Letter* vouches for the fact:—

"PEELER, THE DOG OF THE POLICE.—During a recent in-

vestigation relative to the manner in which the policeman came by his death at Kingstown, a little active and inquisitive dog, of the Labrador breed, was seen from time to time during each day running in and out of the room, as if he took a personal interest in the inquiry. The dog was admired, and a gentleman in the police establishment was asked to whom it belonged. 'Oh,' said he, 'don't you know him? We thought every one knew Peeler, the dog of the police.' The gentleman then proceeded to give the interrogator the history of this singular dog. It appeared from the story, that a few years ago poor little Peeler tempted the canine appetite of a Mount St. Bernard, or Newfoundland dog, and was in peril of being swallowed up by him for a luncheon, when a policeman interposed, and, with a blow of his bâton, levelled the assailant and rescued the assailed. From that time, Peeler has united his fortunes with those of the police: wherever they go, he follows; whether pacing with measured tread the tedious 'beat,' or engaged in the energetic duty of arresting a disturber of the public peace. He is a self-constituted general superintendent of the police, visiting station after station, and, after he has made his observations in one district, wending his way to the next. He is frequently seen to enter a third-class carriage at the Kingstown Railway, get out at Black Rock, visit the police-station there, continue his tour of inspection to Booterstown, reach there in time for the train as before, and go on to Dublin to take a peep at the 'metropolitans;' and having satisfied himself that 'all is right,' return by an early evening train to Kingstown. He sometimes takes a dislike to an individual, and shuns him as anxiously as he wags his tail at the approach, and frisks about the feet, of another for whom he has a regard. There is one man in the force for whom he has this antipathy; and a day or two ago, seeing him in 'the train,' he left the carriage and waited for the next, preferring a delay of half an hour to such company; and when the bell rang, with the eagerness with which protracted joy is sought, he ran to his accustomed seat in 'the third class.' His partiality for the police is extraordinary; wherever he sees a man in the garb of a constable, he expresses his pleasure by walking near him, rubbing against and dancing about him; nor does he forget him in death, for he was at his post in the funeral of Daly, the policeman who was killed in Kingstown. He is able to recognize a few in plain clothes, but they must have been old friends of his. Wherever he goes he gets a crust, a piece of meat, a pat

on the head, or a rub down upon his glossy back, from the hand of a policeman; and he is as well known amongst the body as any man in it. We have heard of the dog of Montargis, the soldier's dog, the blind beggar's dog, and the dog of the monks of St. Bernard, and been delighted by stories of their fidelity and sagacity; but none are more interesting than 'Peeler, the dog of the Police,' 'whose heart, enlarged with gratitude to one, grows bountiful to all.'"

THE SETTER, OR LAND SPANIEL.

The setter partakes of the peculiarities of the pointer and spaniel, and, as the former dog derives its name from its habit of standing still and pointing at any game it may discover, the setter is so called because of its custom of "setting" or crouching when marking down its game. There are several varieties of setter. Respecting the common Old English Setter, an authority on such matters gives the following as the points the thoroughbred animal should possess:—"A moderately heavy head, but not so much so as in the pointer; the muzzle not so broad nor square in profile, the lower being nearly rounded off, but the upper being still nearly a right angle The eye is similar to that of the pointer, but not so soft, being more sparkling, and full of spirit; the ear long, but thin, and covered with soft silky hair, slightly waved. The neck is long, but straighter than that of the pointer, being also lighter, and very flexible. The back and loins are as strong as those of the pointer, the latter also being rather longer; the hips also are more ragged, and the ribs not so round and barrel-like. The tail, or 'flag,' is usually set on a little lower, is furnished with a fan-like brush of long hair, and is slightly curled upward towards the tip; but it never should be carried over the back or raised above the level of its root, excepting while standing, and then a slight elevation is admired, every hair standing down with a stiff and regular appearance. The elbow, when in perfection, is placed so low as to be fully an inch below the brisket, making the fore-arm appear very short. The hind feet and legs are clothed with hair, or 'feathered,' as it is called, in the same way as the fore-legs, and the amount of this beautiful provision is taken into consideration in selecting a dog for his points."

The setter has its peculiarities respecting water. To get through a day's work creditably, it should be enabled to wet the whole of its body every half-hour or so. Moreover, it cannot do without water to drink so long as the pointer, though

having drunk its fill, it can endure heat and fatigue much longer than the pointer. In wet or very cold weather the setter is to be preferred before the pointer, the body of the former being securely protected by a flowing coat, while the latter is short-haired; consequently, in warm weather the pointer is preferable. The setter hunts by "body scent," as it is called, in contradistinction to the power possessed by the beagle, harrier, &c., who follow the foot-prints of their game, or hunt by "foot-scent."

Mr. Bell, in his "British Quadrupeds," relates an anecdote of the setter, that at once settles any question that may arise as to the animal's intelligence:—

"By far the most interesting, and, if I may so employ the term, amiable animal I have ever known, was a bitch of this kind, formerly belonging to my father, which he had from a puppy, and which, although never regularly broke, was the best dog in the field that he ever possessed. The very expression of poor Juno's countenance was full of sensibility and affection. She appeared to be always on the watch to evince her love and gratitude to those who were kind to her; and the instinct of attachment was in her so powerful that it showed itself in her conduct to other animals as well as to her human friends. A kitten which had been lately taken from its mother was sent to us, and on Juno's approach showed the usual horror of the cat towards dogs; but Juno seemed determined to conquer the antipathy, and, by the most winning and persevering kindness and forbearance, advancing or receding as she

found the waywardness of her new friend's temper required, she completely attached the kitten to her; and as she had lately lost her puppies, and still had some milk left, I have often seen them lying together before the fire, the kitten sucking her kind foster-mother, who was licking and caressing her as her own offspring. She would also play with great gentleness with some tame rabbits of mine, and would entice them to familiarity by the kindness of her manner; and so fond was she of caressing the young of her own species, that when a spaniel bitch of my father's had puppies, of which all excepting one were destroyed, Juno would take every opportunity to steal the remaining one from its mother's nest and carry it to her own, where she would lick and fondle it with the greatest tenderness. Poor Busy, the mother, also a good-tempered creature, as soon as she had discovered the theft, hastened of course to bring back her little one, which was again to be stolen on the first favourable opportunity, until at length the two bitches killed the poor puppy between them, as they were endeavouring each to pull it from the other; and all this with the most perfect mutual good understanding. Juno lived to a good old age, an unspoiled pet, after her master had shot to her for fourteen seasons."

The Scotch setter stands higher on his legs than the English or Irish breed, and its hair is somewhat longer. The Irish setter much resembles the English, but has thicker legs, and "is distinguished," says a modern writer, "from its English relative by a certain Hibernian air that characterizes it, and which, although conspicuous enough to the practised eye, is not easy of description." Russia claims a setter of its own, an animal whose hair is long and woolly, and generally so matted that the true form of the dog is not clear to the casual observer. It is slower in its movements than the other breeds, but is possessed of a much more delicate scent, and is pronounced by sportsmen who have had opportunities to test and compare their merits, that in its peculiar way the Russian setter is unsurpassed. The muzzle of this dog matches that of a Scotch terrier for hairiness; and its feet are likewise covered with hair, which serves as an important protection in long and rough travelling.

THE RETRIEVER.

Like the pointer and the setter, this dog derives its name from its special utility—that of "retrieving" and recovering

game that has fallen at a distance after being shot. In height the retriever measures from twenty to twenty-four inches, and is powerfully built. Its colour is almost invariably black, and its fur of a moderate length and curled. There are many breeds of retrievers, but the most favourite are those derived either from the Newfoundland dog and setter or from the water-spaniel and terrier. A smaller retriever is produced by the beagle and terrier, and for stealth and quiet the smaller is superior to the larger sort in wild-game shooting.

As the animal is not born a retriever, but merely comes in its puppyhood into its master's hands an intelligent dog of promising parentage, some pains must be taken to teach it its business. It must be taught, as its first lesson — how dreadfully hard it must come to the uproarious little puppy — never to bark in business hours. Such an impropriety would disturb the game in the neighbourhood, and be to the sportsman the unlucky means of saving their lives. It must be tanght not to eat the game as soon as it finds it, but to bring it straight to its master, and lay it at his feet. Being sent for a thing, it must be charged with the errand over and over again till it performs it, or it may be apt to infer that you are not very particular about the recovery of your game, and — especially if it be tired—shape its behaviour accordingly.

THE POINTER.

"A moderately large head, wide rather than long, with a high forehead and an intelligent eye of medium size. Muzzle

broad, with its outline square in front, and not receding, as in the hound. Flews (*i.e.* the overhanging lips) manifestly present, but not pendant. The head should be well set on the neck, with a peculiar form at the junction, only seen in the pointer. The neck itself should be long, covered in its upper outline, without any tendency to a dewlap or a ruff, as the loose skin covered with long hair round the neck is called. The body is of good length, with a strong loin, wide hips, and rather arched ribs, the chest being well let down, but not in a hatchet-shape, as in the greyhound, and the depth in the back ribs being proportionably greater than in that dog. The tail, or stern as it is technically called, is strong at the root, but, suddenly diminishing, it becomes very fine, and then continues nearly of the same size to within two inches of the tip, where it goes off to a point, looking as sharp as the sting of a wasp, and giving the whole very much the appearance of that part of the insect, but magnified, of course. This peculiar shape of the stern characterizes the breed, and its absence shows a cross with the hound or some other dog." This, according to Stonehenge, is a description every true-blooded pointer should answer, and, according to the same authority, white dogs with lemon-coloured heads are to be preferred before all others.

How faithful this dog is to its peculiar instinct will be found illustrated among the "Stories of Intelligent Dogs" in another part of this volume. That it has considerable contempt for anyone less enthusiastic in the chase than himself the following incident furnished by Captain Brown will show:—

"A gentleman having requested the loan of a pointer dog from a friend, was informed by him that the dog would behave very well so long as he could kill his birds; but if he frequently missed them, the dog would run home and leave him. The pointer was accordingly sent, and the following day was fixed for trial; but, unfortunately, his new master happened to be a remarkably bad shot. Bird after bird rose and was fired at, but still pursued its flight untouched, till at last the dog became careless, and often missed his game. As if seemingly willing, however, to give one chance more, he made a dead stop at a fern-bush, with his nose pointed downward, the fore-foot bent, and the tail straight and steady. In this position he remained firm till the sportsman was close to him, with both barrels cocked; then moving steadily forward for a few paces, he at last stood still near a bunch of heather, the tail expressing the anxiety of the mind by moving regularly backwards and for-

wards. At last, out sprang a fine old blackcock. Bang, bang, went both barrels—but the bird escaped unhurt. The patience of the dog was now quite exhausted, and, instead of dropping to the charge, he turned bodily round, placed his tail between his legs, gave one howl, long and loud, and set off as fast as he could to his own home."

THE KING CHARLES SPANIEL.

This well-known animal, to be really a fine specimen, should not exceed six or seven pounds in weight. It is not wanting in courage or hunting instinct, but, as may be naturally supposed of a dog leading so refined a life, its endurance is very limited. It is a wonderfully clever little creature, and the amusing tricks recorded of it may be counted by scores. I prefer, however, giving my readers an instance of spaniel sagacity wherein was exhibited something better than fun—curious and wonderful affection. As regards the truth of the anecdote, I need merely add that it is related by Mrs. S. C. Hall:—

. . . "The King Charles named Chloe was my grandmother's favourite. She was a meek, soft, fawning little creature, blind of one eye, and so gentle and faithful, refusing food except from the one dear hand that was liberal of kindness to her. Chloe's puppies were in great demand, and it must be confessed her supplies were very bountiful—too bountiful indeed, for out of the four, which she considered a proper number at a birth, two were generally drowned. My grandmother thought that Chloe ought not to raise more than two. Chloe believed that she

could educate four, and it was always difficult to abstract the doomed ones from the watchful little mother. It so chanced that once, after the two pups had been drowned by the stable-man, poor Chloe discovered their little wet bodies in the stable-yard, and brought them to the live ones that remained in the basket. She licked them, cherished them, howled over them, but they still remained damp and cold. Gentle at all other times, she would not now permit even her mistress to remove them, and no stratagem could draw her from the basket. At last we suppose Chloe felt it was not good for the dead and the living to be together, so she took one of the poor things in her mouth, walked with it across the lawn to the spot where a lovely red-thorn tree made a shady place, dug a hole, laid the puppy in it, came back for the other, placed it with its little relative, scraped the earth over them, and returned sadly and slowly to her duties."

The Blenheim spaniel is, when thorough bred, smaller even than the King Charles. Like the latter, to be of value it should possess a very short muzzle, very long silky ears falling close to the head, and touching the ground as the dog walks. The legs should be covered with long glossy hair to the toes, and the tail should be well "feathered," as the fanciers say. The eyes of both these dogs are always extremely moist. The hair covering the whole body should be slightly "wavy," but should not curl.

The Maltese is another dog of the "toy" school. It is remarkable for the extreme fineness, gloss, and length of its hair. Maltese dogs barely exceeding three pounds in weight have been known to measure fifteen inches in length of hair across the shoulders. As its name implies, it originally came from Malta. It is among the rarest of our canine pets.

THE TERRIER.

No dogs are so well known in England as these, and it may be safely said that there is scarcely a mongrel, be he ever so thorough a castaway and vagabond, but has terrier blood in his lean body. The more he has of it the better for him, especially if he have a living to pick up, and a lodging to procure, and no master to help him. The dog with anything of the terrier about him is sure to be a shrewd dog—a more or less knowing reader of the human countenance, a quality by no means to be despised in a houseless dog; it often—especially when he finds himself late on a bitter winter night, with no

better sanctuary against the north wind and the snow—procures the poor animal a lodging from a human pedestrian, who, trudging along home to his bit of hot supper and comfortable bed, is unable to resist the imploring eyes, and the meekly insinuating wag of the tail. For my part, I must own to a

feeling of considerable satisfaction when one of these houseless creatures so makes up to me. I comfort myself with the reflection that I must carry about with me an air of charity and goodwill, and am the better assured of it that it is a dog that reveals it. I believe that there was never yet so consummate a hypocrite but that a really clever dog would find him out. At the same time, I am bound to state my conviction that, giving effect to my vanity, I have several times been taken in by artful dogs—dissipated canine scoundrels that have been locked out, and that ungratefully and without the trifling acknowledgment of a wag of the tail, bolt off as soon as the gate is opened in the morning.

The English terrier is not a large dog. It seldom weighs over ten pounds, and very frequently less. It is square-chested, and its fore-legs are particularly muscular. Its muzzle is sharp, its forehead high, and its eyes large, bright, and intelligent. Its coat is sleek and smooth. The colours of the pure breed are black and tan, the value of the animal much depending on the richness of the two tints. To be perfect it should have a small patch of tan colour over each eye; its nose and palate should be black.

It is a very busy, intelligent, fussing little animal, but not

particularly courageous. If a dog is wanted to rout out a rat colony, no dog can so effectually set them scampering as the English terrier. Killing them, however, is a business which this dog declines. While the rat runs, the dog will run after it, but when the rat stops, so does the dog, and at a respectful distance, too Should the rat show fight the English terrier takes to his heels.

Not so his cousin, the bull terrier. He it is that delights in carnage, and is never so thoroughly happy as when he is literally up to his eyes in rats in a rat-pit. His courage is wonderful. As many as five or six savage rats at one time have been seen clinging with their sharp teeth to the ratter's lips and nose and eyebrows, but the dog has never once winced nor paused in his attack. It is curious, too, how little of bull-dog blood goes to furnish a dog with this contempt for pain on the one hand, and fierce desire to inflict it on the other. It is not too much to say that the most valuable of bull-terriers in London have been independent of the bull-dog for six or seven generations. Some of these dogs, while weighing no more than six pounds, will be matched to kill large rats in a minute each, and that for an hour together.

The Scotch terrier is a quaint-looking, clever little dog, almost as remarkable for its animosity to vermin as the bull-terrier. Its colours are, as a rule, the same as the English terrier, mingled with grey. It was this dog that in ancient times was used in the cruel sport of "badger-drawing." There is, as says a popular writer, "A peculiar breed of Scotch terriers, called the Dandy Dimmont, in honour of the character of that name in Scott's 'Guy Mannering.' These dogs are of two colours; one a light brown, with a reddish tinge termed 'mustard,' and the other a bluish-gray on the body, and tan on the legs, denominated 'pepper.' These little animals are very courageous; although they often exhibit no proof of their bold nature until they have passed the age of two years, appearing until that time to be rather cowardly than otherwise. This conduct is supposed to be occasioned by their gentle and affectionate disposition. The legs of this variety of terrier are short in proportion to the length of the body, the hair is wiry and abundant, and the ears are large, hanging closely over the sides of the head."

The "Skye" is certainly the oddest terrier of the family. It would be worth inquiring how it is that this dog is so con-

stantly losing himself. That this is the case, any one taking ordinary notice of window-bills and placards must have discovered. It can't be that the dog's extraordinary value tempts the dog-thief, for many dogs allowed as much freedom as the Skye, are of much more value, and are but seldom "lost or stolen." Is it that the poor creature's vision is so obstructed by his hirsute furniture that he can but dimly make out where he is going? Is it that he is a stupid blundering dog, who really doesn't care which way he goes, or what becomes of him? Or is he a dog of so much intelligence and of such an inquiring mind that he is impelled to investigate any and every odd matter that may turn up in the course of a morning's walk?

It is generally regarded as a "toy" dog, and is usually clever at learning tricks, and displays considerable affection. It is, however, the largest, or, rather, the heaviest of the "toys," and can seldom be obtained weighing less than ten or twelve pounds. When of pure breed the legs are very short, and the body extremely long in proportion to the length of limb; the neck is powerfully made, but of considerable length, and the head is also elongated, so that the total length of the animal is three times as great as its height. The "duo-claws" are wanting in this variety of domestic dog. The hair is long and straight, falling heavily over the body and limbs, and hanging so thickly upon the face, that the eyes and nose are hardly perceptible under their luxuriant covering. The quality of the hair is rather harsh and wiry in the pure-bred Skye-terrier, for the silky texture of the generality of "toy" Skyes is obtained by a cross with the spaniel. It is easy to detect the presence of this cross by the scanty appearance of the hair on the face.

THE POODLE.

This is certainly an intelligent dog, and it is possibly on this account, because it is capable of performing extraordinary tricks, that its master is at considerable pains to bestow on it an extraordinary appearance. That the dog should be subjected to such indignity, however, is no wonder, when we see the same spirit actuating mountebanks, acrobats, and other "performing" specimens of humanity. Since Signor Jacko cannot possibly turn that tremendous number of somersaults without he wears a girdle of spangles, and a gorgeous star or crescent on his forehead, it is no wonder that he renders his

performing poodle hideous by shaving off its coat, leaving nothing but a few rags about its throat and toes.

There are few doggy tricks the poodle cannot be taught to perform, in the water as well as on land. He is a cunning rascal. Jessie, in his "Gleanings," mentions a poodle belonging to a friend of his, for whom correction was found necessary; he being sometimes rather unruly, the gentleman bought a whip, with which he corrected him once or twice when out walking; on his return he left the whip on the hall table, and in the morning it was missing; having been found concealed in an out-building, and, as before, used when occasion required, in correcting the dog, it was once more missed; but on the dog, who was suspected of having stolen it, being watched, he was seen to take it from the hall table, in order to hide it as before.

"There was a story when we were in Heidelberg," says the "Dublin University Magazine," "going about of a certain student who had a remarkably fine white poodle, that used daily to accompany his master to the lecture-room of a professor, who was not very remarkable for the distinctness of his vision; he would regularly take his seat upon the bench beside his master, and peer into his book, as if he understood every word of it. One wet morning, the lecture-room, never, at any time, remarkable for its fulness, was deserted, save by the student who owned the poodle. The dog, however, had somehow happened to remain at home. 'Gentlemen,' said the short-sighted professor, as he commenced his lecture, 'I am sorry to notice, that the very attentive student in the white coat, whose industry I have not failed to observe, is, contrary to his usual custom, absent to-day!'"

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THE SHEEP-DOG.

STORIES OF INTELLIGENT DOGS.

There is such a host of them that the difficulty is where to begin. There are celebrated water-dogs, which have saved folks from death by drowning; and celebrated fire-dogs, that have rescued human beings from that most terrible of all deaths, burning. There are wide-awake men's dogs, trained to poach and to commit petty larceny in a way worthy of the treadmill; and blind men's dogs, trained to pilot their helpless masters through the most crowded thoroughfares, to carry their contribution-box, and to appeal imploringly with their eyes for a copper. There are dogs who funnily sham combat with Mr. Punch; and real warrior dogs, who have been through all the perils of the battle-field, and returned home scarred invalids. There are—

But this is not a catalogue, says the reader; the list you have already furnished is quite long enough: we already know there *are* such dogs as you have mentioned; what about them?

First of all about a sheep-dog; and that the reader may have not the least hesitation in accepting it as strictly true, I may mention that Mr. Hogg—the Ettrick Shepherd—was the dog's master. He gave a drover a guinea for the animal, because, "notwithstanding his dejected and forlorn appearance, I thought I discovered a sort of sullen intelligence in his countenance."

"He was scarcely a year old, and knew so little of herding that he had never turned a sheep in his life; but as soon as he discovered that it was his duty to do so, and that it obliged me, I can never forget with what eagerness and anxiety he learned his evolutions. He would try every way deliberately, till he found out what I wanted him to do; and when I once made him to understand a direction he never forgot or mistook it again. Well as I knew him he often astonished me, for often, when pressed hard in accomplishing the tasks that he was put to, he had expedients of the moment that bespoke a great share of the reasoning faculty.

"On one occasion, about seven hundred lambs, which were under his care at feeding-time, broke up at midnight, and scampered off in three divisions, across the neighbouring hills, in spite of all that he and an assistant could do to keep them together. The night was so dark that we could not see 'Sirrah' (the dog's name), but the faithful animal heard his master lament his absence in words which of all others were sure to set him most on the alert, and without more ado he silently set off in quest of the recreant flocks. Meanwhile the shepherd and his companions did not fail to do all in their power to recover their lost charge. They spent the whole night in scouring the hills for miles round; but of neither the lambs nor Sirrah could they find the slightest trace. They had nothing for it, day having dawned, but to return to their master and inform him that they had lost the whole flock of lambs, and did not know what had become of one of them. On our way home, however, we discovered a lot of lambs at the bottom of a deep ravine, and the indefatigable Sirrah standing in front of them looking round for some relief, but still true to his charge. The sun was then up, and when we first came in view we concluded it was one of the divisions, which Sirrah had been unable to manage till he arrived at that commanding situation. But what was our astonishment when we discovered that not one lamb of the entire flock was wanting! How he had got all the divisions collected in the dark, is beyond my comprehension. The charge was left to himself from midnight till the rising sun, and if all the shepherds in the forest had been there to have assisted him, he could not have effected it with greater promptitude."

The same gentleman likewise narrates a story in which a sheep-dog, through over zeal, brought his master to the gallows. The man had resolved to make an adventure in the crime of

sheep-stealing; and having selected some sheep from the flock of a former master, he and his dog commenced driving them away; but before he had got them off the farm, he, whether from the voice of conscience or the terror of possible consequences, countermanded the execution of the project, and drove the sheep back again. He called his dog away, and, mounting his pony, rode off at a gallop. But halting at the distance of three miles, and looking round, he there saw the stolen sheep at his heels, with his dog in their rear, driving them before him at a furious rate. The young man, as soon as he recovered from his amazement, severely whipped the dog for his disobedience, and then again rode off. The dog, however, was evidently quite in the dark as to what he had been whipped for, for after trotting on before the pony some distance, he once more slipped behind, and speedily fetched up the unlucky sheep, sweating and panting from the rate at which they had been made to travel. By this time day was beginning to dawn, and the owner of the dog, feeling that it would be impossible for him to make a defence against such overwhelming evidence, and seeing that he could not wash his hands clean of the stolen property, disposed of the sheep, for which he was shortly afterwards condemned to death.

Despite the opinion of certain writers, that the greyhound is a silly dog—that "his flat forehead and elongated snout are emblems of stupidity"—there are not wanting instances to prove that he at times shows himself as shrewd as any of his canine brethren. The well-known Mr. Youatt tells a story corroborative of this. Two greyhounds were concerned, and their chief weakness was, that whenever and wherever they saw or scented meat, they felt bound at any risk to possess themselves of it and devour it. This was a serious matter, not so much on account of the value of the plunder, as that its inordinate consumption made the dogs fat and lazy, and altogether unfit for coursing. Adjoining the kennel there was a room in which was suspended an iron caldron, in which the dog's-meat was cooked. It would have been supposed that the meat once in the pot, and the pot surrounded by a blaze, the cook might safely take his departure to attend to his other duties. Such a course, however, could not be followed, inasmuch as the theft of the boiling meat was certain to be the result. One dog would rear against the side of the pot, pat open the lid with his paw, and, taking any projecting scrap of the joint within his teeth, whip the whole out and on to the

floor, and as soon as it was sufficiently cool it was eaten to their hearts' content. "This plan having been discovered, the lid of the boiler was furnished with an iron rod, passing under the handle, and tied to the handle of the boiler on each side. Only a few days elapsed before the dogs had learned to gnaw the cord asunder, and to help themselves as before. Iron chains were then substituted for the cords, and the meat cooked in safety for nearly a week. But the ingenuity of the dogs was not to be baffled. They continued to raise themselves on their hind-legs, and by applying their strength at the same moment, pushed the boiler fairly off the fire, and set it rolling on the floor; when, although the iron chains prevented their getting at the meat, they were enabled to lap up the broth as it streamed on the floor."

The above-mentioned dogs evinced so much unswerving determination and defiance of burns and scalds, that in all probability they were not of genuine greyhound breed, but indebted for their courage to a dash of bull-dog blood. For this blending of speed with pluck and endurance, the sporting world is indebted to Lord Offord, who was the first to try this crossing with his greyhounds. That the result was perfectly satisfactory may be gathered from the following incident, printed a short time back in a sporting newspaper:—"A gentleman of Worcester, paying a visit to a friend a few miles distant, took with him a brace of greyhounds, for the purpose of a day's coursing. A hare was soon found, which the dogs chased for several miles, and with such speed as to be very soon out of sight of the party who pursued; but after a very considerable search, both the dogs and the hare were found dead within a few yards of each other; nor did it appear that the former had caught the hare, as no marks of violence were discovered on her."

An anecdote, proving that too implicit confidence may be placed in a dog's sagacity, is related by Mr. Wood. That gentleman was at the time a school-boy at Oxford, and, in the warm weather, adopted the healthful custom of bathing. While so engaged, however, on one occasion, along with his mates, a thief was observed stealing off with the wearing apparel of the entire company, and it was only after a smart and interesting chase that he was overtaken and properly ducked for his pains. Although on this occasion they recovered their garments, they could scarce help reflecting on what would have been the result if the thief had been too nimble

for them, and set about devising some means of protection for the future.

There happened to reside in the neighbourhood a great dog—half mastiff, half blood-hound—called Nelson. The lads had observed how satisfied the haymakers were to leave their jackets and dinners even in the charge of a little cur-dog, and so resolved to press Nelson as store-keeper.

"We took Nelson with us, being the only dog that we knew, and when we had undressed we put him in charge. He laid down in the most exemplary manner, and doubtless would have made an excellent guardian had he not been disturbed by an unexpected incident. The field was full of cows, and they, seeing a great dog in the field, felt aggrieved and summoned a council. In a very few minutes the whole body of cows set up their tails and charged down upon Nelson. He lay in some perplexity till one or two of them almost poked him with their horns, when he lost his calmness of demeanour and dashed at the nearest cow. His teeth, however, were nearly gone from old age, and the cow easily shook him off. There was then a grand battle, in which our clothes seemed likely to be trodden to pieces, so we were forced to take them up and swim across the river with them, and deposit them on the opposite bank, where there were no cows. We then got Nelson away and took him over; but we never afterwards trusted a big dog to take care of our clothes."

The same authority tells a singular dog-and-lamb story. The dog was not of the sheep-herding breed, but a great spotted Danish dog, commonly used to accompany carriages. "One of these animals was of a very playful disposition, and particularly rejoiced in chasing sheep, although he never hurt them. He was one day amusing himself in this manner, and making a flock of sheep scatter in all directions, when a black lamb turned round and looked him in the face. The dog was quite taken aback, and remained irresolute, until the black lamb began to dance about and play with him. This generosity of disposition quite overcame the dog, and he slunk away with his tail between his legs, and seemed thoroughly confused. Presently his new-made acquaintance began to challenge him to a game of play, by cutting all manner of capers round him. By degrees the dog regained his composure of mind and accepted the challenge. Off they went, tumbling over each other and playing like a couple of kittens. They ran off at such a pace, that the boy who was in charge of the flock began to be

anxious about his lamb, and went to fetch it. The lamb, however, preferred the company of its new friend to that of the boy, and refused to come. The owner of the dog then tried to assist the shepherd by calling off the dog, but the latter paid no more attention to his master than the lamb did to the shepherd. For more than a mile and a half did these two strange playfellows continue their sport; and, as they described a large circle in so doing, the owner of the dog and the shepherd were enabled to cross a stream, by means of a plank, before the dog and lamb came up. When they came to the bridge, the shepherd, after repelling several attempts on the part of the lamb to force the passage, succeeded in securing it with his crook, and prevented its escape by tying it up in his plaid. Finding his companion thus subducted, the dog reluctantly obeyed the commands of his master, and slowly followed him from the spot, while the lamb made every effort to follow the dog, and tried to gain its point by jumping into the stream. This adventure had rather a singular effect on the dog, for he ever afterwards abstained from chasing sheep."

Many curious stories might be told about bull-dogs, but, unluckily, they are, as a rule, of a most shocking and barbarous character, and to repeat them would be but to gratify the brutal-minded, and shock those of harmonious intellect. The following—the shortest, and really one of the least sanguinary of the number—will serve as a specimen. Scene: a bull-ring, Birmingham. Period: forty-five years ago.

"Mr. Jackson's dog, Billy, having been declared the victor, a gentleman, well known for his extensive betting transactions, stepped up to where the dog's master and his friends were collected round the exhausted Billy. 'I'll wager fifty pounds to ten,' said the gentleman, 'that he don't pin another bull within two hours of this.' 'Pshaw,' replied Mr. Jackson, 'you would lose your money, sir. He could do it with his front paw lopped off.' 'I'll wager five fifties to five tens he don't,' laughed the gentleman. 'Done!' replied Mr. Jackson; and calling for a cleaver he at a blow lopped off a paw, and, a fresh bull being provided, the gallant 'Billy,' without a moment's hesitation, limped to the charge on his three legs. The applause of the crowd was tremendous. 'I'll double stakes that he does the trick on *two* feet,' exclaimed the delighted Mr. Jackson. 'Done!' said the gentleman; and again the cleaver was called into operation, and poor Billy's front props reduced to stumps. Still the brave dog was nothing daunted, and tackled

his bull as bravely as ever. The cheers were deafening. 'I'll once more double stakes that he finishes him with *no* feet,' roared Mr. Jackson. The wager was accepted, and, to the astonishment of all present, the poor creature hobbled to the bull and made good his grip, thus winning for his master little short of a thousand pounds." Good old times!

The bull-terrier, next to the bull-dog, is more remarkable than any other of the canine race for courage and unflinching endurance of pain. It is this creature that is so famous for its extermination of rats, and though, when full-bred, it weighs no more than six or seven pounds, it has been known to destroy fifty rats, each weighing nearly, or quite, a pound, in less than half an hour. One of the most celebrated of this family was a little creature whose weight was only five pounds and a half, and who during his life was supposed to have killed at least five thousand rats, the weight of which may be safely computed at a ton and a half. He lived till a good old age, and died the death of a ratter. "He happened to hear or to smell a rat which was in a cage in another room; and, being chained in an adjoining apartment and unable even to see the rat, he chafed and fretted himself into such feverish agitation that he died a short time afterwards, although allowed to kill the rat."

The behaviour of one of these ratting dogs in the rat-pit was some time ago described by a writer in "Fraser's Magazine," and is so humorous, and at the same time so graphic, that I will present the reader with an abridgment.

"At last Pincher is produced and handed over to his second in the pit. He is a very lean dog, with a great development of rib and jaw, calm and self-possessed, not in the least nervous or excited, but treating the whole affair as a matter of business. From the very arms of his 'second' he looks down on the rats with an eye professional and critical, settling in his own mind what particular sewer they were bred in, making a rough estimate of their average size and condition, and comparing them, considered as a lot, with the last batch he disposed of On the signal being given, Pincher is placed on the floor, and immediately plunges his snout into one of the rat-heaps. For a few seconds there is a steady sound of snap, crunch, craunch, snap, showing that he is doing good business; after which he raises his head a moment for breath, and then, thinking he has done enough for the present in that quarter, transfers his attention to the next heap. By this time the rats are fully alive to the fact of their position, and are running

about with considerable liveliness, promoted in some degree by the attendant who stirs them up with his foot. And now I perceive in Pincher a want of generalship which makes me very much inclined to back time, if I knew how to do it. Instead of steadily sticking to one heap, and finishing it off before he begins on another, he allows himself to be seduced into desultory dashes at loose and unattached rats which sometimes lead him a long chase, and entail on him a considerable waste of time and breath. I am afraid the excellent dog has never read Coleridge's useful little book on Method.

"Meantime the clock, as Bon Gaultier says, is 'ticking onwards,' and the tale of rats is far from complete. The floor is strewn with the jerking bodies of the moribund, but the living still muster pretty strong in the corners, and dodge between Pincher's legs with provoking activity, and now the excitement becomes perfectly savage. The backers of time, who were at first a little despondent, are in high feather, as the minute-hand approaches the fatal point, while the supporters of Pincher bang the sides of the pit with the frantic energy of despair, and stimulate their champion with yells of 'Hi, Pincher!' 'Ah, Pincher!' 'Yah, Pincher!' 'Hurrah, Pincher!' Pincher himself looks as if it had dawned on him that he has overrated himself. Still he buckles to his work dogfully, and chops, and snaps, and crunches, with the persevering pluck of a bull-terrier and a Briton. But no, my Pincher; it is not to be done—on this occasion, at least. The decisive word is uttered; time is up. One more victory is added to the triumphs of that calm old vanquisher of dogs and men; one more laurel is turned round his bald brow. Time is the victor by nine rats; and Pincher the vanquished leaves the pit a sadder and a wiser dog. As I go out I see him at the bar in conversation with a rough Scotch-terrier. He is evidently telling him how, after the sixty-fourth rat, he knew he had no chance, and how he never could kill rats satisfactorily in that pit."

Of course, it is only by constant attention to the breed of the bull-terrier that it is reduced to its naturally light and elegant shape, while it still retains in its blood all the "bull." The first progeny of the true terrier and the bull-dog, although decidedly far from beautiful, is excellent for activity and indomitable pluck. It was one of these that Mr. Anderson—of Lake Ngami celebrity—possessed, and in the praise of which

he is so eloquent. Here is one of the little dog's exploits. Mr. Anderson had wounded a huge rhinoceros, which somehow managed to escape a few hundred yards and then came to a stand.

"At break of day my men were on his trail. He had still strength enough to make a dash at them; and would probably have laid hold on some of them had not a small bitch (half terrier and half bull-dog, and called Venus in derision of her ugliness) caught the enraged animal by the lower lip, where she stuck with such tenacity that the rhinoceros, with all his fury, was unable to shake her off. She only relinquished her hold when her huge antagonist was fairly laid prostrate by a ball. The sagacity of this favourite dog was as great as her courage. Being now in a game country, all sorts of beasts of prey abounded, more especially jackals, which might be seen running about by dozens. In order not to frighten the elephant and other large animals, we were in the habit of encamping some little way from the water, to which Miss Venus regularly resorted to bathe and drink. On seeing a jackal, she instantly crouched, looking very timid. Reynard mistaking her posture for an indication of fear, and probably thinking that from her diminutive size she would prove an easy conquest, boldly approached the supposed victim. But he had reckoned without his host; for the instant that the cunning dog found her antagonist sufficiently near, she leapt like a cat at his throat, and, once there, the beast had no chance. She then returned to the camp, where her contented looks and bleeding jaws soon attracted the attention of the men, who immediately went on her track and brought in the jackal, who was valued on account of his fur."

"I once possessed a dog, a pointer," writes a friend of the Rev. J. G. Wood, "whose nose, sight, and instinct were well developed; and, as he was my companion for many a day, and my only friend for many months, some of his peculiarities may not be uninteresting.

"The dog could point a partridge, but would eat it too if he had a chance; and often when I could not take a day's shooting I have observed my dog doing a little amateur work on his own account. Very successful also was he in this occupation, and he frequently dined on a partridge or quail which he had gained by means of his own skill. There was no concealing the fact, however, that he was an arrant coward, and he himself was perfectly conscious of this defect. As is usual amongst

men, he endeavoured to conceal his weakness by the aid of a formidable exterior, and few who knew him not would ever venture to insinuate that he was not brave as a lion. If he happened to encounter any other dog with which he was unacquainted, he would immediately stand perfectly still, raise his tail, and keep it very firmly in one position; he would then elevate the hair on his back, and, dragging up his jowls, would exhibit a formidable array of grinders. Thus exhibiting a by no means prepossessing appearance, he would merely growl, whilst the other dog walked round him, and he thus frequently prevented any liberties being taken with him. No sooner had his visitor left him than his attitude would change, and with a glance as much as to say 'I did that very well,' he would jog along before me. In spite of his warlike positions, he was once terribly punished by a little terrier which resided in a butcher's shambles. Passing this locality, my dog was set upon before he had time to study attitudes or assume a *pose*, so he made good use of his legs and escaped with a few scratches.

"Now it happened that among his friends he had one which was a well-bred bull-terrier, and, after the mauling that he had received from the butcher's dog, I noticed that he was very much oftener with this friend than he had been before. The next time I attempted to take him past the shambles he refused, and retreated home. I followed him, and by dint of whistling, brought him out from his retreat, from which he was followed by the bull-terrier. The two jogged along very pleasantly and cheerfully, my dog evidently paying marked attention to his friend. When we approached the locality of the shambles, my dog ran along in front, whilst the bull-terrier followed behind, and both looked as though they were "up" to something. Opposite the shambles the terrier rushed out at my dog, which retreated with astonishing precipitancy behind his friend, who at once collared the assailant, and tumbled him over to the tune of the joyful barks of my old cur, which had evidently made with his friend the preliminary arrangement for this scene."

That dogs are capable of scheming together, and of carrying out their schemes jointly or separately, no end of evidence might be collected. A curious instance of this was once witnessed by my brother and myself. We were walking through a bye street in Islington, when there came trotting up the street towards us two ragged, mud-spattered, cross-bred curs, with "tramp" and "beggar" visibly written on their countenances. They were

young dogs, however, and their poverty was no check on their spirits, so they came rollicking along, pushing and cuffing each other, and performing such tricks as naturally suggest themselves to young and depraved minds resolved on vagabondage. Presently, however, the rather bigger dog assumed a serious deportment—a change which his companion no sooner observed then he too became suddenly grave, and the two, instead of reckless canine ruffians, appeared as slow-going, journey-worn, poor little dogs, to whom ever so stale a paunch would be a gift for which to wag their tails till they were loose with gratitude. Presently the bigger dog left the road, and took to the pavement, along which he slowly walked, while his friend trotted ahead and then stretched himself in the shadow of the kerb, with his nose on his paws. Meanwhile, dog number one slunk along the pavement with a most cadger-like gait till he came to some private houses whose areas were guarded by railings. Down the first area the dog looked with a professional eye, paused a moment, and passed on; so with the second; but on reaching the third house, through the kitchen window of which some of the inmates were visible, he reared on his hind legs, and, crooking his front paws imploringly, there he stood for at least a minute. The folks in the kitchen, however, either did not observe the petitioner, or else, knowing him as an incorrigible beggar, did not think fit to encourage him. Anyhow, he did not get any relief, though he waited long enough to tire his mate's patience, as was evident by the latter getting up and yawning frightfully. The beggar seemed, from his experience at the stingy house, to augur ill of the entire street; so, joining his friend, they ceased to be hypocrites, and renewed the "larks" deferred by the calls of business.

Mr. Smee, in his "Instinct and Reason," tells a story in proof of the assertion that the affection of the dog is natural, and not dictated by selfish motives. Mr. Smee gives the names and addresses of the parties concerned, as well as the exact locality in Germany where the incident occurred. Three dogs were present, two belonging to one gentleman and the other to another gentleman. The three dogs, without the consent of their masters, started and pursued a rabbit, which finally took refuge in a burrow, when one of the dogs, carried forward by the ardour of pursuit, plunged so deeply into the subterraneous opening that retreat became impossible. "After having scratched to no purpose in the hope of extricating him, the two companions returned home in such a state of sadness and dejection as to be

noticed by their masters, who knew not to what to attribute the cause. The next day came a fresh disappearance of the two dogs, which had found a means of joining each other. They were seen to return in the evening to their respective domiciles, harassed with fatigue, to refuse every sort of nourishment, their paws bloody, and their bodies covered with earth and sweat. At first no attention was paid to what took place; but the same procedure being repeated on the next and succeeding days, and M. S. not finding his dog come home, together with the daily disappearance of his other dog, and his nightly return in such a dreadful condition, mentioned the circumstance to M. P., who declared to him that his dog had done the same thing for a week. Finally, the day following, M. S. was awakened early in the morning by the cries of several dogs who scratched at his door. He came down to see what was the matter, and what was his astonishment, when he saw his dog, which he thought lost, feeble, languid, and like a mere skeleton, escorted by its two liberators to the house of its master, and which, seeing it in his care, went to sleep tranquilly on a bundle of straw, scarcely able to move their stiffened limbs. M. S. made a search to discover the place where this touching scene had occurred. He discovered that the narrow opening into which his dog had forced itself was transformed into a large cavity, the working out of which was evidently due to the intelligence of the two other dogs."

Sporting dogs, as a whole, seem to discover much more sagacity, combined with faithfulness to their leading instincts, than household dogs. The pointer is a marvellous instance of this. The moment he falls on a scent, he lifts one paw from the ground, and stands on the remaining three, with his face, back, and tail all forming a straight line. This is his regular behaviour when the wind is as it should be, and no obstacles present themselves. This, however, is not invariably the case: an untoward circumstance sometimes turns up, and the dog is brought suddenly close to the game. The heat of the chase, however, is insufficient to disturb the pointer's sense of duty. Instantly the twitching muscles are still, and head, body, limbs, seem suddenly converted into stone. Whatever may have been the position of his body at the moment the discovery was made, that position is retained. Sometimes it has happened that when the pointer has been in the act of springing over a strong fence, he has hit upon the scent of birds lying close to it, and he has then been seen to halt suddenly on the top of the wall

or fence, with his four feet collected together and his body almost doubled up.

Some capital stories, illustrative of the undying affection of the dog for its master, are related in a little work, "The Sportsman's Cabinet," and from which the following is abbreviated:—

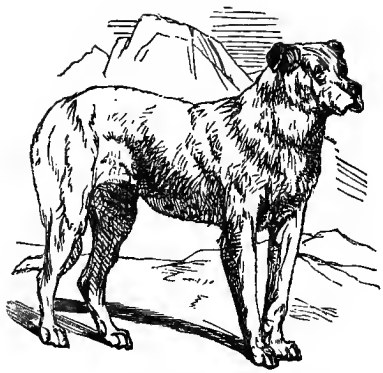
At Halling, in Kent, there lived a farmer of the name of Hankes, who had a dog that was remarkably attached to him, and followed him about wherever he went. One day he went to Maidstone market, his faithful canine friend, as usual, accompanying him. Having occasion to stop there till late in the evening, he at last proceeded on his way home; but stopping at Aylesford, he there drank so immoderately as to be quite intoxicated before he again was on his journey home. It was at a very bad season of the year—the roads, "at the best very dangerous to a drunken man," were covered with snow—and the night was intensely cold. Having passed the village of Newhead in safety, he took his way over Snodland Brook. He had proceeded in safety, till he came to the Willow Walk, within half a mile of the church, when, by a sudden stagger, he quitted the path, and passed over a ditch on his right hand. Not apprehensive he was going astray, he took towards the river, but having a high bank to mount, and being nearly exhausted with wandering and the effect of the liquor, he was most fortunately prevented from rising the mound, or he certainly must have precipitated himself into the Medway. At this moment, completely overcome, he fell among the snow in one of the coldest nights ever known, turning upon his back, and was soon overpowered with sleep or cold.

In this situation the farmer must soon have slumbered in death; he was in a desolate country, where, in all probability, he would never have received any human help. His sole help depended upon his faithful companion, the dog; nor, in this emergency, did he prove less sagacious than the most intelligent human being could have been under the circumstances. The snow was still falling heavily, and the man would soon have been buried in it; but the dog cleared all the snow round the helpless man, so as to form a kind of wall around him. Then, rolling himself up, he lay on his master's bosom, thereby preserving the warmth and circulation of the blood; and so remained all night, doubtless without closing an eye. The next morning a person happened to be passing that way, in search of wild-fowl, and stumbled across the body of the man—

the dog still curled on his breast. Immediately on seeing the stranger, however, it ran to his side, imploring, in the most pathetic manner, his assistance for its master. The man was by this time, to all appearance, perfectly lifeless; but assistance being procured, the body was removed to the nearest village, and, various remedies being applied, he ultimately recovered, and told the remarkable story of his escape.

In gratitude to his preserver, the farmer had a silver collar made, to perpetuate the remembrance of this noble deed, which the dog ever afterwards wore. To its master's honour be it recorded, that when, a little time after this event, a gentleman offered him ten guineas for the animal, the farmer indignantly refused. "So long," he said, "as he had a bone to his meat, or a crust to his bread, he would divide it with the faithful friend who had preserved his life."

POMERANIAN DOG.



MOUNT SAINT BERNARD MASTIFF.

One of the most wonderful dog stories ever related appeared some time ago in that highly respectable medical journal the *Lancet*,— a sufficient guarantee, it may be fairly assumed, for its authenticity. It is an important feature of the narrative that the owner of the dogs was a gentleman of good means, who trained the animals solely for his amusement and that of his friends:—

"Two fine dogs, of the Spanish breed, were introduced by M. Léonard, with the customary French *politesse*—the largest, by the name of M. Philax; the other, as M. Brac (or Spot). The former had been in training three, the latter two years. They were in vigorous health, and having bowed very gracefully, seated themselves on the hearth-rug side by side. M. Léonard then gave a lively description of the means he had employed to develop the cerebral system in these animals; how, from having been fond of the chase, and ambitious of possessing the best trained dogs, he had employed the usual course of training—how the conviction had been impressed on his mind, that by gentle usage, and steady perseverance in inducing the animal to repeat again and again what was required — not only would the dog be capable of performing that specific act, but that part of the brain which was brought into activity by

the mental effort would become more largely developed, and hence a permanent increase of mental power be obtained. This reasoning is in accordance with the known laws of the physiology of the nervous system, and is fraught with the most important results. We may refer the reader interested in the subject to the masterly little work of Doctor Verity, 'Change produced in the Nervous System by Civilization.' After this introduction, M. Léonard spoke to his dogs in French, in his usual tone, and ordered one of them to walk, the other to lie down, to run, to gallop, halt, crouch, &c., which they performed as promptly and correctly as the most docile children. Then he directed them to go through the usual exercises of the *manége*, which they performed as well as the best-trained ponies at Astley's. He next placed six cards of different colours on the floor, and, sitting with his back to the dogs, directed one to pick up the blue card, and the other the white, &c., varying his orders rapidly, and speaking in such a manner that it was impossible the dogs could have executed his commands if they had not a perfect knowledge of the words. For instance, M. Léonard said, 'Philax, take the red card and give it to Brac; and Brac, take the white card and give it to Philax.' The dogs instantly did this, and exchanged cards with each other. He then said, 'Philax, put your card on the green; and Brac, put yours on the blue,' and this was instantly performed. Pieces of bread and meat were placed on the floor, with figured cards, and a variety of directions were given to the dogs, so as to put their intelligence and obedience to a severe test. They brought the meat, bread, or cards, as commanded, but did not attempt to eat or to touch, unless ordered. Philax was then ordered to bring a piece of meat and give it to Brac, and then Brac was told to give it back to Philax, who was to return it to its place. Philax was next told he might bring a piece of bread and eat it; but, before he had time to swallow it, his master forebade him, and directed him to show that he had not disobeyed, and the dog instantly protruded the crust between his lips."

This, however, was not the most curious of the performances of the wonderful animals. The account proceeds —"Presently: M. Léonard invited a gentleman to play a game of dominoes with one of the animals. The younger and slighter dog then seated himself on a chair at the table, and the writer and M. Léonard seated themselves opposite. Six dominoes were placed on their edges in the usual manner before the dog, and

a like number before the writer. The dog having a double number, took one up in his mouth, and put it in the middle of the table; the writer played a corresponding piece on one side; the dog immediately played another correctly; and so on till all the pieces were engaged. Other six dominoes were then given to each, and the writer intentionally played a wrong number. The dog looked surprised, stared very earnestly at the writer, growled, and finally barked angrily. Finding that no notice was taken of his remonstrance, he pushed away the wrong domino with his nose, and taking up a suitable one from his own pieces, played it instead. The writer then played correctly; the dog followed, and won the game."

The lady whose name has already been used in connection with the King Charles spaniel story tells a pleasant anecdote of dogs working in concert, though not in so peaceable a manner as is revealed by the foregoing narrative. The lady possessed a small retriever—very pretty, but very hot tempered—named Charger, and another dog — a tremendous mastiff — named Neptune. Charger's deportment towards his big relative was no less insolent than towards the rest of the world, but the great dog was a generous fellow, and either pretended not to hear the petty abuse of the other, or else looked amused and wagged his tail.

"But," says Mrs. Hall, "all dogs were not equally charitable, and Charger had a long-standing quarrel with a huge bull-dog, I believe it was—for it was ugly and ferocious enough to be a bull-dog—belonging to a butcher—the only butcher within a circuit of five miles—who lived at Carrick, and was called the Lad of Carrick. He was very nearly as authoritative as his bull-dog. It chanced that Charger and the bull-dog had met somewhere, and the result was, that our beautiful retriever was brought home so fearfully mangled that it was a question whether it should not be shot at once, everything like recovery seeming impossible.

"But I really think Neptune saved his life. The trusty friend applied himself to carefully licking his wounds, hanging over him with such tenderness, and gazing at his master with such mute entreaty, that it was resolved to leave the dogs together for that night. The devotion of the great dog knew no change; he suffered any of the people to dress his friend's wounds, or feed him, but he growled if they attempted to remove him. Although at the end of ten or twelve days he could limp to the sunny spots of the lawn—always attended

by Neptune,—it was quite three months before Charger was himself again, and his recovery was entirely attributed to Neptune, who ever after that was called Doctor Neptune—a distinction which he received with his usual gravity. Now, here I must say that Neptune was never quarrelsome. He was a very large liver-coloured dog, with huge firm jaws, and those small cunning eyes which I always think detract from the beauty of the head of the Newfoundland; his paws were pillows, and his chest broad and firm. He was a dignified, gentlemanly dog, who looked down on the ordinary run of quarrels as quite beneath him. If grievously insulted he would lift up the aggressor in his jaws, shake him, and let him go—*if he could go*—that was all. But in his heart of hearts he resented the treatment his friend had received.

"So when Charger was fully recovered, the two dogs set off together to the Hill of Carrick, a distance of more than a mile from their home, and then and there set upon the bull-dog. While we were at breakfast the butler came in with the information that something had gone wrong, for both Neptune and Charger had come home covered with blood and wounds, and were licking each other in the little stable. This was quickly followed by a visit from the bristly Lad of Carrick, crying like a child,—the great rough-looking bear of a man—because our dogs had gone up the Hill and killed his pup, "Bluenose." 'The two fell on him,' he said, 'together, and now you could hardly tell his head from his tail.' It was a fearful retribution; but even his master confessed that Bluenose deserved his fate, and every cur in the country rejoiced that he was dead."

Jesse relates a story of a dog of a sporting tendency, and which belonged to a master of the same inclination. The gentleman, however, was a very bad shot, a failing which the dog, who usually accompanied him, took very much to heart. Once or twice missing, the hound didn't mind—that will happen to the most accomplished sportsman—but if, after banging away for half an hour, no fall of feathers resulted, the indignant brute would grow more and more angry till at last he would fly at the unlucky sportsman, and fiercely shake any part of his raiment he could catch in his jaws. "This," says Mr. Jesse, "is much the case with my old terrier, Peter. He accompanies me when I am trolling, watches every throw with much anxiety, and shows great impatience and some degree of anger if I am a long time without taking a fish; when I do he appears delighted."

The same authority relates an anecdote exhibiting the dog in a new and not very creditable light. Here we have the noble animal faithful unto death even to the shivering beggar, turned wolf—not a savage wolf of the wilderness, but a polite and polished wolf, growing fat on the bounty of the traveller, instead of on the traveller's carcase.

The gentlemen who related the story to Mr. Jesse were riding from Geneva to Basle, when they discovered a fine-looking dog following them. The coachman disclaimed any knowledge of the animal, which continued with the carriage through the whole of the day's journey. "When we stopped for the night, by close attendance on us as we alighted, and sundry wags of the tail, looking up into our faces, he installed himself in our good graces, and claimed to be enrolled a regular member of the *cortége*. 'Give that poor dog a good supper, for he has followed us all day,' was the direction to the people of the inn; and I took care to see it obeyed. This affair of the dog furnished conversation after our dinner. We were unanimous in the conviction that we had done nothing to entice the animal, and washed our hands of any intention to steal him. We concluded that he had lost his master, and, as all well-educated and discriminating dogs will do in such a dilemma, that he had adopted other protectors, and had shown his good sense and taste in the selection. It was clear, therefore, that we were bound to take care of him.

"He was a stout dog, with a cross of the mastiff in him; an able-bodied trudger, well formed for scuffling in a market-place. He was a dog also of much self-possession. In our transits through the villages he paid but little attention to the curs which now and then attacked him. He followed us to Basle; we assigned to him the name of Carlo, which he had already learned to answer readily; we became quite attached to him, and the affection appeared to be mutual. At Basle we told the innkeeper the story, and added, that we had now nothing to do but to take the dog to England with us, as we could not shake him off. The landlord smiled. 'Why,' said I, 'is it your dog?' 'No,' said he. 'Does he belong to any one you know?' 'No,' replied the host. 'Why do you smile then?' 'Vous verrez.' 'Well, but explain.' 'Well, then,' said the landlord, 'this dog, which belongs to no one, is in the habit of attaching himself to travellers passing between this place and Geneva. He has often been at my house before. I know the dog well. Be assured he will not go farther with

you.' We smiled in our turn: the dog's affection was so very marked.

"The next morning the dog was about as usual. He came to us, and received a double portion of caresses for past services, also some food in consideration of the long trot before him. The horses were to—we sprang into the carriage, and off we started. Hie Carlo! Carlo!—hie Carlo! Not a leg did he wag, but only his tail. Carlo—Carlo—Carlo!—The deuce a bit did he stir. He stood watching us with his eyes for a few seconds, as we rolled along, and then, turning round, walked leisurely up the inn-yard! Whilst the confounded landlord stood at his door, laughing!"

In cases where animals of totally different natures have exhibited an undoubted affection for each other—as between wolves and children, and cats and mice, naturalists, Jesse among the number, have endeavoured to explain the matter in a way more prosaic than pleasant. Of the wolf that carried off the child and tenderly nursed it in its den, and of the grimalkin caught in the act of suckling a mouse, they say that selfishness and not affection is at the bottom of it; that the savage she-animals finding themselves, through the loss of their young, or some other accident, incommoded by their teeming udders, are content to sink their animosity for their proper prey, in the relief and pleasure they experience in having their teats drawn.

THE MANAGEMENT OF PUPPIES.

Should your canine she-pet have pups, it will be well to adopt the following directions. Don't handle them during the first week any more than is absolutely necessary. The mother will be spared considerable anxiety if you observe this. Beyond making her a comfortable bed, or, rather, supplying her with comfortable bedding material, and allowing her plenty of good food, your attentions may be spared. You must, however, be careful that excessive fondness for her progeny does not so far lead her to neglect exercise as to injure her health. No doubt she will, on the day following the birth of her family, be very loth to respond to your whistle, and would much rather stay at home and cuddle her babies than go a-walking. In this, however,—always assuming her to be a healthy animal,—she must not be indulged. Take her a short walk—say of a mile's length, and then let her return to her family. Afterwards, she may be expected to get about pretty much as usual.

Some she-dogs are averse to suckling the pups they give birth to; others will, as is the case with cats, rabbits, and other animals, eat them as soon as they come into the world. Both sorts of dog are, of course, objectionable; but, in my opinion, the last-mentioned is least so. The she that evinces no inclination to give suck to her pups, is, in all probability, physically incapable of performing that necessary function, and will remain so, to the expense and perplexity of her owner, as long as she lives; but the disposition to cannibalism is not likely to be a fixed propensity. As no satisfactory cause for the apparently unnatural act has yet been assigned, one cannot be wrong in choosing to ascribe it to benevolent, rather than to malicious motives. One thing is certain, that the animal may eat her pups once, and never, in the whole course of her life, repeat the eccentricity. Indeed, it has been remarked that such dogs are generally among the most affectionate and well disposed.

As before stated, the mother of the pups must be generously fed. Healthy pups will, after the first few days, add at least an ounce daily to their weight; and in cases where the unlucky mother has five or six youngsters, it may be easily imagined that the drain on her system must be enormous—five ounces of puppy-flesh and bone to be realized from her teats! At the same time, it must of course be borne in mind

that *discrimination* as regards feeding must be observed as scrupulously now as at any other time.

With dogs of value, especially "toy" dogs, there is a natural desire on the part of the owner to save as many of each litter as possible, and he need be in no fear but that the affectionate parent will gladly second his designs,—frequently, however, with lamentable results to all parties. Dogs of choice breeds, especially those of smaller size, are seldom particularly strong, and cram them with as much nourishment as you please, they are still unable to produce sufficient milk for the maintenance of the little troop of gluttons. You may easily ascertain if her strength is being over-taxed. While she is suckling, her countenance, instead of being expressive of unmistakable pleasure and content, will wear a nervous, jaded air, and she will from time to time "nose" among the restless suckers, as though conveying the gentlest hint in the world that they have been pulling a longish time, and now, perhaps, wouldn't mind letting mother have a bit of a rest. She does not recline easily with her progeny at her dugs, but lies along the ground and pants, as though, as is actually the case, her very life was being drained out of her. She will get up and go creeping about the house in the most anxious and melancholy way, and maternal care presently conquering bodily pain, back she will go to the kennel, to be at once seized by the hungry pups, who, of course, pull all the harder for there being little to pull at. The end of this is that the poor mother has fainting fits.

There is but one way of saving the poor animal. The fits of themselves are not imminently dangerous, but they indicate a state of such extreme weakness, that the dog may be said to be bound straight for death, unless the existing condition of things be altered. Tonics must be administered and the mother at once removed from her progeny. As to the latter, you must either bring them up by hand or provide them with a foster parent.

As a rule, the hand-raised puppy will at the end of a month be sufficiently established in life to be equal, in a certain degree, to the business of self-feeding. Its tender mouth, however, must not at first be too severely tasked. A mixture of finely-shredded meat, mixed with soaked ship-biscuit or boiled rice, is as good food as any.

HOW TO FEED THE DOG.

Not one among our catalogue of Home Pets stands so likely a chance of being "killed by kindness" as the domestic dog; the gentle murder being rendered more easy of accomplishment through the creature himself being only too happy, not only to accept the "forbidden fruit," but most pertinaciously to solicit it. I have heard the fair owners of "lap" dogs—those unfortunate canine wretches whose diminutive size, or the fashionable colour and texture of their coats, render fit and proper occupants of the parlour and drawing-room—justify their treatment of them in the most amusing ways: one persisting that an animal of such a high order of intellect as the dog would never choose to eat anything hurtful to its constitution; another, that since wholesome meat and milk were beneficial to human beings, they must be good for dogs; another, that it might be all very well, as regarded the dog's health, to feed it on such coarse and nasty food as paunch and plain rice, but that it stood to sense that such feeding must tend to deteriorate the silkiness of "darling Floss's" coat, and render his body gross and unbearable.

This last, although, perhaps, the most ludicrous error, is most serious, because it is most common. What, however, says a sound and modern authority on this subject? "Animals not worked, but kept as favourites, or allowed only to range at pleasure, should not have any meat, or be permitted to consume any large quantity of fatty substances. Butter, fat, or grease,

soon renders the skin of the dog diseased, and its body gross. Milk, fine bread, cakes, or sugar, are better fare for children; given to the brute, they are apt to generate disorder, which a long course of medicine will not in every case eradicate. Nice food, or that which a human being would so consider, is, in fact, not fitted to support the dog in health. It may appear offensive to ladies when they behold their favourites gorge rankly, but Nature has wisely ordained that her numerous children should, by their difference of appetite, consume the produce of the earth. The dog, therefore, can enjoy and thrive on that which man thinks of with disgust; but our reason sees in this circumstance no fact worthy of our exclamation. The animal seeking the provender its Creator formed it to relish is not *necessarily* unclean. . . . . The spaniel which, bloated with sweets, escapes from the drawing-room to amuse itself with a bone picked from a dunghill, follows but the inclination of its kind, and, while tearing with its teeth the dirt-begrimed morsel, it is, according to its nature, daintily employed. . . . . An occasional bone, and even a little dirt, are beneficial to the canine race; while food nicely minced, and served on plates, is calculated to do harm. Rich and immoderate living fattens to excess, destroys activity, renders the bowels costive, and causes the teeth to be encrusted with tartar."

First, concerning the *sort* of food that should be given to house-dogs, little or big.

Meat, when allowed, cannot be of too coarse a quality; the shin or the cheek of the ox being preferable to the ribs or buttocks; it should be lean. Paunch is excellent meat for dogs, and to aristocratic bow-wows it may be given in the form of tripe. Never allow your dog to eat what is commonly known as "cat's-meat." I am loth to say a word that may work ill towards any branch of industry, but there is little doubt that the abolition of the "cat's-meat" business would be an immense benefit to the canine and feline races. Consider the long odds that exist against the chance of the horseflesh being nutritious? First, it may be safely reckoned that at least a fourth of the number of horses killed are diseased. Secondly, it is generally pitched into the cauldron almost before it is cold; and as it does not in the least concern either the wholesale or the retail dealer, whether the meat be lean or tough, very little attention is paid to the boiling. Thirdly, the retail dealer—the peripatetic cat's-meat man—as a rule, brings the meat hot from the copper, and though, perhaps, equally as a rule, yet by no means as an

exception, souses it into cold water to make it cut "firm." After these explanations, the owner of a dog may judge of the nutriment to be derived from cat's-meat.

Bullock's liver is good for dogs, not as the staple of its food, as it is laxative, but say twice a week, when its medicinal properties will be beneficial; besides that, it breaks the monotony of "paunch for dinner." It is much more laxative in a raw than a boiled state. It will be well to bear in mind that raw meat is more stimulative than cooked meat; consequently, for idle dogs the latter is preferable. Oatmeal porridge is good for dogs, so is ship-biscuit. Rice is excellent, besides being very cheap. A pound of shin of beef boiled, and the broth saved, and a pound of rice boiled the next day in the broth, will serve a hearty dog nearly a week. Persons having lap-dogs will find the keep upon rice, properly seasoned or soaked in gravy, less likely to render them gross, and their bodies inodorous, than dining them daily from the family-joint. Never give a dog *warm* meat; sooner or later, it will certainly enfeeble digestion.

For dogs that are ill, food should be prepared with extreme care. Sickness cannot be relieved without trouble, and in many cases an animal requires as much attention as a child. To gain success neither time nor labour must be spared. Nothing smoked or burnt, no refuse or tainted flesh, must on any account be made use of. The meat may be coarse, but it should be fresh and wholesome. Dirty saucepans or dishes ought not to be employed; and so very important are these circumstances, that the practitioner who engages in dog-practice will often surprise his acquaintances by being seen at market, or busied over the fire. Beef-tea is one of the articles which, in extreme cases, is of great service. Few servants, however, make it properly, and where a dog is concerned, there are fewer still who will credit that any pains should be bestowed on the decoction.

This is the way the beef-tea should be prepared. Take half-a-pound of beef, cut from the neck or round is better than any other part; but it does not matter how coarse the quality may be. Divest the beef of every particle of skin and fat, and mince it as fine as sausage-meat. Put it into a clean saucepan, with a pint of water, and stand it on the hob at such a distance from the fire that it will be half-an-hour before it boils. Let it boil ten minutes; set it aside to cool; skim off what fat there may be on the surface, and, without the addition of

salt or any kind of seasoning, the beef-tea is ready for your canine patients. However, we will say no more of sick dogs at present; they will be treated of presently.

Feed your dog *once* a day, and do not give him his food on a plate. That is a politeness he can very well dispense with; besides that, his health will be advantaged by a waiving of such ceremony. Throw him his meat on the floor—not on to a paved or plank floor, but on the earth. The quantity of the latter he will swallow with his meat will not hurt him: on the contrary, it will stimulate his intestines. Feed him *regularly*. Reflect on your own case, and on what an annoying, not to say painful, thing it is to be kept hungry two or three hours after your customary dinner-time, and be merciful. As to the quantity of food with which a dog should be supplied, it is impossible to direct, as, like men, no two dogs eat alike, and many a healthy little dog will comfortably stow away as much as would serve a big dog for two meals. The owner of a dog, however, may easily ascertain the wholesome limit of his dog's appetite. Set before him in a corner, where he will not be disturbed, an ample allowance, or more, and, unobserved, keep your eye on him. If he be in health, he will set to, and not abate his industry till he feels comfortably full; then he will raise his head, and move away from the remnants. Marking this, and to save him eating to repletion, as he certainly will, if allowed, you will remove what is left, and so learn what should be his regular allowance.

A large, hard bone thrown to the dog very frequently will be useful to him; not for the sake of what he may pick off it—indeed, the less there is on it the better—but to keep his teeth in order. Concerning bones generally, however, the remarks of Mr. Edward Mayhew may be studied with profit. "A dog in strong health may digest an occasional meal of bones; but the 'pet' has generally a weak, and often a diseased stomach, which would be irritated by what would otherwise do no harm. The animal, nevertheless, true to its instincts, has always an inclination to swallow such substances, provided its teeth can break off a piece of convenient size for deglutition. Game and chicken bones, which are readily crushed, should therefore be withheld, for not unfrequently is choking caused by pieces sticking in the œsophagus; though more often is vomiting induced by irritation of the stomach, or serious impactment of the posterior intestine ensues upon the feebleness of the digestion."

Concerning "scraps," too, the last-quoted authority has something instructive to communicate. "However strict may be the orders, and however sincere may be the disposition to observe them, scraps will fall; bits *will* be thrown down; dishes will be placed on the ground; and sometimes affection will venture to offer 'just a little piece,' which no one could call feeding. It is astonishing how much will in this way be picked up, for the dog that lies most before the kitchen fire is generally the fattest, laziest, and at feeding-time the best behaved of the company. Consequently, no dog should be allowed to enter the kitchen, for their arts in working upon mortal frailty can only be met by insisting on their absence. The dog that is well fed and not crammed should not refuse bread when it is offered. If this be rejected, while sugar is snapped eagerly, it will be pretty certain either that the animal is too much indulged, or that its health requires attention."

DOG-WASHING.

Dogs if properly treated will but seldom require washing. Frequent washing, especially where soap, soda, &c., is used, renders the hair harsh and rough, and much more liable to catch the dirt than the hair of the dog treated as a rule by the dry process. All that is required is a comb with a fine and a coarse end, and a stiff brush. It should be combed and brushed regularly every morning, and if it is allowed to get its coat muddied the mud should stay on till it is quite dry, when it may be dusted and brushed out without leaving a stain.

An *occasional* wash will be beneficial, but in the coldest weather the chill only should be taken off the water, and the yolk of an egg used instead of and in the same manner as soap. Many a thin-skinned dog, could it but speak, might tell of the agonies it had endured through the application of coarse soap to its sensitive body. His eyes smart, his skin burns, and if in the event of your not thoroughly rinsing the latter from it he attempts to finish off with a few licks of his tongue, he is made sick and ill. If egg be used all these difficulties may be obviated. As useful a lather as soap lather is produced, it does not burn the animal's skin, and if he wishes to "plume" himself, after his nature, he will not be made ill. A small dog, say a Skye terrier, will not require more than the yolk of a single egg.

Never use luke or even warm water in dog-washing; nothing

is more debilitating to the system; the animal will feel faint and weak, and not at all disposed to frisk about after his immersion. This is the worst part of the business, as it is utterly impossible thoroughly to dry the coat of a long-haired dog, and violent cold is the result.

A cold bath, which is of course altogether different from a cold *wash*, will not hurt a robust dog even if it be practised every morning. Here again, however, there are one or two important rules to be observed. Do not allow the dog's *head* to be plunged under water; it does no sort of good, and inflicts on it a certain amount of pain. Even if it be a stupid dog, and unable to keep its head above water, a very little assistance from you, applied to the nape of the neck, will effect the purpose. With the other hand the dog's coat should be stirred and roughed so that it be thoroughly saturated.

In this case, as in washing, it is almost useless trying to dry the animal by means of the towel; dried, however, he must be, and that by his own bodily exertion. In all probability he will be much more inclined to skulk by the kitchen fire than to scamper about, in which case you must rouse him, and either take or send him out for a run. A good plan, if you live in the country, is to take him a mile or so out and then give him a dip in a brook; if he take deep offence at the proceeding, and scamper home as hard as his legs will carry him, so much the better for his health. If, however, you would try the same trick the next morning you had better pass a string through his collar, otherwise he will never be induced to approach the scene of yesterday's discomfiture.

PARASITES.

For the destruction of fleas a well-known authority directs as follows: "The dog must be taken from the place where it has been accustomed to sleep. The bed must be entirely removed and the kennel sluiced—not merely washed—with boiling water, after which it should be painted with spirits of turpentine. The dog itself ought to be washed with eggs and water with a teaspoonful of turpentine to each egg-yolk. After this the animal should have yellow-deal shavings to sleep on, and if they are frequently renewed the annoyance will seldom be again complained of. As, however, exceptional cases will always start up, should the tribe not be entirely dispersed the washing must be repeated, or if from want of time or other cause it be inconvenient to repeat the operation, a

little powdered camphor rubbed into the coat will abate and often eradicate the nuisance."

For fleas and other skin-biting pests Mr. Wood recommends "Persian Insect Destroying Powder" to be applied in the following manner: "First dust the dog well with the substance until every portion of him has received a few particles of the powder, and then put him into a strong canvass bag in which a handful of the powder has been placed and shake well about, so as to distribute it equally over the interior of the bag. Leave his head protruding from the bag, and put on his head and neck a linen rag in which are holes for his nose and eyes, and let the interior of the rag be well coated with the powder. Lay him on the ground and let him tumble about as much as he desires, the more the better. In an hour or two let him out of the bag and scrub his coat well with a stiff brush. In a week or so the operation should be repeated in order to destroy the creatures that have been produced from the unhatched eggs that always resist the power of the destructive powder."

Another remedy is to take the dog into an apartment where grease-spots on the floor are of no particular consequence and saturate his coat completely with castor oil. Such is applied with the hand, but it may be done with a brush. So leave it for twelve hours, and then cleanse the animal with yolk of egg and water. This, however, although an effective process, is a troublesome and an expensive one, as a small dog will require quite a pound of the oil, and a large dog, such as a Newfoundland, four or five pounds.

MALTESE DOG.

DISEASES OF THE DOG.

Let us start with the most terrible of all, Hydrophobia; the most terrible, because, as says a celebrated dog-doctor, "of the causes or treatment of the disorder we know nothing, neither, considering the nature of the study, are we likely to learn!" Where, then, is the use of writing on such a painful subject? More uses than one, good reader. To enable you to recognize in your own pet the earlier stages of the disease, should it be unluckily so afflicted; to endeavour to demonstrate a fact which it is to be feared is too little understood, that a rabid dog is not a malicious enemy to mankind, but a poor, suffering brute, to be regarded pitifully.

The most graphic account of the commencement, progress, and termination of Hydrophobia in the dog ever written, is to be found, together with a wealth of other canine information, in a work lately published by Mr. Edward Mayhew, M.R.C.V.S. The description is so thoroughly excellent, that I shall take the liberty of quoting it entire.

"The dog that is going mad feels unwell for a long time prior to the full development of the disease. He is very ill; but he does not know what ails him. He feels nasty, dissatisfied with everything, vexed without a reason, and, greatly against his better nature, very snappish. Feeling thus, he longs to avoid all annoyance by being alone. This makes him seem strange to those unaccustomed to him. This sensation induces him to seek solitude. But there is another reason that decides his choice of a resting-place. The sun is to him an instrument of torture, which he therefore studies to avoid, for his brain aches and feels, as it were, a trembling jelly. This induces the poor brute to find out the holes and corners where he is least likely to be noticed, and into which the light is unable to enter. If his retreat be discovered, and his master's voice bid him come forth, the countenance of the faithful creature brightens, his tail beats the ground, and he leaves his hiding-place, anxious to obey the loved authority; but before he has gone half the distance, a kind of sensation comes over him which produces an instantaneous change in his whole appearance. He seems to say to himself, 'Why cannot you let me alone? Go away—do go away! You trouble and pain me,' and thereon he suddenly turns tail, and darts back to his dark corner. If let alone, there he will remain, perhaps frothing a little at the

mouth, and drinking a great deal of water, but not issuing from his hiding-place to seek food.

"His appetites are altered. Hair, straw, dirt, filth, tar, shavings, stones, the most noisome and unnatural substances are the delicacies for which the poor dog, changed by disease, longs and swallows in hope to ease his burning stomach. Still, he does not desire to bite mankind; he rather endeavours to avoid society; he takes long journeys of thirty or forty miles in extent, and lengthened by all kinds of accidents, to vent his restless desire for motion. When on these journeys he does not walk. This would be too formal and measured a pace for an animal whose whole frame quivers with excitement. He does not run. That would be too great an exertion for a creature whose body is the abode of a deadly sickness. He proceeds in a slouching manner, in a kind of trot, a movement neither run nor walk, and his aspect is dejected. His eyes do not glare, but are dull and retracted. His appearance is very characteristic, and if once seen can never afterwards be mistaken. In this state he will travel the most dusty roads, his tongue hanging dry from his open mouth, from which, however, there drops no foam. His course is not straight. How could it be, since it is doubtful whether at these periods he can see at all? His desire is to journey unnoticed. If no one notices him, he gladly passes on. He is very ill. He cannot stay to bite. If, nevertheless, anything opposes his progress, he will, as if by impulse, snap—as a man in a similar state might strike, and tell the person 'to get out of his way.' He may take his road across a field, in which there are a flock of sheep. Could these creatures only make room for him and stand motionless, the dog would pass on and leave them behind uninjured. But they begin to run, and at the sound the dog pricks up his ears. His entire aspect changes. Rage takes possession of him. What made that noise? He pursues it with all the energy of madness. He flies at one; then at another. He does not mangle, nor is his bite simply considered terrible. He cannot pause to tear the creature he has bitten. He snaps, and then rushes onward, till, fairly exhausted, and unable longer to follow, he sinks down, and the sheep pass forward to be no more molested.

"He may be slain while on these excursions; but if he escapes he returns home and seeks the darkness and quiet of his former abode. His thirst increases, but with it comes the swelling of the throat. He will plunge his head into water, so ravenous

is his desire; but not a drop of the liquid can he swallow, though its surface be covered with bubbles, in consequence of the efforts he makes to gulp the smallest quantity. The throat is enlarged to that extent which will permit nothing to pass. His state of suffering is most pitiable. He has lost all self-reliance; even feeling has gone. He flies at, pulls to pieces, anything within his reach. An animal in this condition being confined near a fire, flew at the burning mass, pulled out the live coals, and, in his fury, crunched them. The noise he makes is incessant and peculiar. It begins as a bark, which sound being too torturing to be continued, is quickly changed to a howl, which is suddenly cut short in the middle; and so the poor wretch at last falls, worn out by a terrible disease."

How Hydrophobia (literally, "dread of water," and altogether a wrong name for the disease, as it is clearly proved that when at the height of its madness the desire to drink is unabated, the ability being frustrated by physical causes) is generated is still a mystery. It is certain that the venom lies in the *saliva*, and that its application to the abrased skin of another animal, without even a touch of the mad dog's teeth, is sufficient to impart the terrible disease. Hot weather has been supposed to be favourable to the development of rabies (see Mad Dog bills issued by the police in July). But dog doctors generally agree that it is quite as prevalent in the winter. Some writers attribute it to thirst, but the reply to that suggestion is, that whereas in a well-watered country like England hydrophobia is lamentably common, in scorching Eastern cities it is unknown. Besides, the latter proposition has been set aside, at least to their own entire satisfaction, by certain scientific Frenchmen, who, with an inhumanity that makes one's flesh creep, and which may not be excused on any ground whatever, caused forty poor dogs to be shut up and *kept without water* till they died. The result was that they (the men, not the dogs), were enabled to show that at least not one out of forty dogs go mad through thirst. One is almost inclined to be cruel enough to wish that the biggest dog of the doomed forty *had* gone mad and bitten the cruel wretch who proposed the monstrous test.

Concerning the treatment of a wound caused by a rabid animal, the patient's fright should be allayed as far as possible. He should be impressed with the fact that a bite from a mad dog is by no means *certain* to produce hydrophobia. He must, however, make up his mind to a rather painful

treatment of his wound. Washing the part is condemned by many medical men; they opine that in the process the virus is diluted and reduced to a state to be the more easily absorbed into the system. Some recommend the cupping-glass. This, says the surgeon, only draws the blood about the wound and accelerates its mixture generally with the poison. The knife is objected to, for "in using the knife that which runs from the newly-made incision is apt to overflow into the poisoned locality and so to convey the venom into the circulation by mixing with the fast-flowing blood as it bathes the enlarged wound.

The simplest and safest mode of treatment is by burning. If it is at hand, take a piece of lunar-caustic and scrape one end of it as small and fine as a writing pencil, with this stab the wound all over. If the caustic is not forthcoming hot-iron will do nearly as well, the best instrument will be a steel fork. It must be used in much the same manner as the caustic, and it should be borne in mind that it is no tenderness to the patient to make the fork "not too hot." The hotter the better for the eradication of the poison and the feelings of the bitten person. It is well known that a burn from a substance heated only to a dull-red inflicts considerably more pain that if brought to a glowing white heat.

Some years ago there appeared in a Prussian newspaper, and since then in various European treatises on dog diseases, an account of how fourteen people were simply and speedily cured of this terrible disorder. As to the efficacy of the remedy employed, no guarantee can here be given. The reader must take it as he finds it and form his own conclusions.

"M. Maraschetti, an operator in the Moscow hospital, while visiting the Ukraine, was applied to by fifteen persons for relief on the same day, they having been bitten by a rabid dog. Whilst the surgeon was preparing such remedies as suggested themselves a deputation of several old men waited upon him with a request that he would permit a peasant who had for some time enjoyed considerable reputation for his success in treating cases of hydrophobia to take these patients under his care. The fame of this peasant and his skill were known to M. Maraschetti, and he acceded to the request of the deputation on certain conditions: in the first place, that he himself should be present and made cognizant of the mode of treatment employed; secondly, that proof should be given him of the dog that had injured the sufferers being really rabid—and then that he, the surgeon, should select one of the patients to

be treated by himself according to the ordinary course adopted by the medical profession. This might, at a hasty view, be deemed an improper tampering with human life on the part of the Russian surgeon; but when the admitted hopelessness of all remedies is recollected, the reader will refrain from animadversion. M. Maraschetti selected, as his own patient, a little girl six years old; the other condition was duly complied with; no doubt could exist of the genuine rabies of the dog, which perished shortly afterwards in extreme agony.

The peasant gave to his fourteen patients a decoction of the tops and blossoms of the broom plant (*Flor. Genistæ luteæ tinctoriæ*), in the quantities of about a pound and a half daily; twice a day he examined beneath their tongues, where, he stated, small *knots*, containing the virus, would form. Several of these knots did eventually appear, and as soon as they did so, they were carefully opened and cauterised with a red-hot wire, after which the patients were made to rinse their mouths, and gargle with the decoction. The result was, that all the patients,—two of whom only, and these the *last bitten*, did not show the knots,—were dismissed cured, at the expiration of six weeks, during which time they had continued to drink the decoction. The poor little girl, who had been treated according to the usual medical formula, was attacked with hydrophobic symptoms on the seventh day, and died within eight hours after the accession of the first paroxysm. M. Maraschetti saw, three years afterwards, the other fourteen persons all living and in good health.

The report goes on to say that the worthy Russian doctor had, some time after, another opportunity of testing the value of decoction of broom as a remedy for the terrible affliction. In this case twenty-six persons were bitten by mad dogs, nine were men, eleven women, and six children. The peasant's remedy was administered with the following results. Five men, all the women, and three of the children exhibited the *knots*; those most severely bitten, on the third day; others on the fifth, seventh, and ninth; and one woman who had been bitten only superficially on the leg, not until the twenty-first day. The remaining seven showed no *knots*, but all continued to drink the decoction; and in six weeks all the patients had recovered.

FITS.

There can be no doubt that fits in a dog are often mistaken

for hydrophobia, and that many a poor beast has been thus summarily and wrongfully slaughtered. Not that fits are harmless, either to the creature or to those who may by chance come within reach of its spasmodically twitching jaws. It is a very serious malady, and its symptoms decidedly lunatic The dog, trotting before or behind his master, will suddenly stand still and look round mazily, and then emitting a curious cry that is neither a bark nor a howl, will fall on his side, continuing the curious noise, but more feebly As soon as he has fallen his limbs assume a strong rigidity, but after a few moments they relax, the animal kicks violently, the eyes are wide open and staring, and foam issues from the mouth. In this condition he will eagerly bite and snap at anything that is put near his mouth. Presently his convulsions will subside, he will raise his head, and look about him, as though wondering what in the name of goodness he does lying on the pavement in the midst of a crowd of men and boys. No doubt in his present dreamy condition he sees himself surrounded on every side by danger, and is anxious to escape. This he is not long in attempting. Starting to his feet, he makes a bolt at somebody's legs, and somebody is only too anxious to skip aside and let the animal pass. He starts off. Never did dog look more mad. Never did mad dog run faster. Hi! Hi! Mad dog! Mad dog! Boys bawl, men shout, women scream, stones are thrown, and carters, secure in their vehicles, endeavour to club him, as he dashes past, with the butt-end of their heavy whips. Presently he receives a blow that stuns him, and tumbles him over in the mud, and he dies the death of a mad dog, however little he may deserve it.

"The first thing to do," says Mr. Mayhew, "when out with a dog which has a fit, is to secure the animal and prevent it running away when the fit is over. The second thing is, for the person who owns the dog stubbornly to close his ears to the crowd who are certain to surround him. No matter what advice may be given, he is to do nothing but get the animal home as quickly as possible. He is neither to lance the mouth, slit the ear, nor cut a piece of its tail off. He is on no account to administer a full dose of salt and water, or a lump of tobacco, or to throw the animal into an adjacent pond; and of all things he is to allow no man more acquainted with dogs than the rest of the spectators to bleed the animal. Any offer to rub the nose with syrup of buckthorn, however confidently he who makes the proposal may recommend that energetic

mode of treatment, is to be unhesitatingly declined. The friendly desire of any one who may express his willingness to ram down the prostrate animal's throat a choice and secret specific must be strenuously declined. Get the dog home with all speed."

Arrived home, should the fit continue, send at once for a veterinary surgeon, as any medicine you can administer will be useless—or worse, because the animal being unconscious cannot swallow, and you may chance to suffocate the creature for whose welfare you are so solicitous. Should the fit be got over, all you can do is to take care that the dog's bowels are in good working order, and keep it cool and quiet for a day or two, on low diet.

INDIGESTION.

From this malady arises the majority of the complaints that afflict dog-kind. All kinds of skin diseases are bred therefrom, and inflammation of the gums, foul teeth, and pestilent breath, are produced from it. It is the origin of asthma, excessive fat, cough, and endless other ailments.

Luckily the symptoms are not very obscure. "A dislike for wholesome food, and a craving for hotly-spiced or highly-sweetened diet is an indication. Thirst and sickness are more marked. A love for eating string, wood, thread, and paper denotes the fact, and is wrongly put down to the prompting of a more mischievous instinct; any want of natural appetite, or any evidence of morbid desire in the case of food, declares the stomach to be disordered. The dog that, when offered a piece of bread, smells it with a sleepy eye, and, without taking it, licks the fingers that present it, has an impaired digestion. Such an animal will perhaps only take the morsel when it is about to be withdrawn; and having got it, does not swallow it, but places it on the ground and stands over it with an air of peevish disgust. A healthy dog is always decided. It will often take that which it cannot eat, but having done so, it either throws the needless possession away, or lies down, and with a determined air watches the property. There is no vexation in its looks, no captiousness in its manner. It eats with decision, and there is purpose in what it does. The reverse is the case with dogs suffering from indigestion."

The old-fashioned remedy for this complaint—at least among dog-quacks—was to shut the pampered animal in a room by himself, and give him nothing but water for two, three, or four

days. Nothing can be farther from the proper course, or more clearly display the operator's ignorance. It would seem that among these old-fashioned worthies, an impression prevailed that so long as an animal's body was burdened with fat, nothing was better for him than a course of starving—regarding the fat, indeed, as so much funded victuals, on which the animal might draw at pleasure; whereas the mere existence of the overloaded sides is evidence sufficient that the dog's stomach is weakly and unable properly to perform its functions; and surely it requires no profound inquiry to discover that a weak and infirm stomach is in much worse case to be trifled with than one strong and vigorous, albeit lean as French beef.

The best mode of treatment is to diet the animal on sound and plain food, taking care that moderation is observed. If he has been in the habit of eating at any and every hour in the day, divide his daily portion into three, and for the first two or three days give him a meal morning, noon, and night. After that his allowance may be cut in two, and only two daily meals given—one at noon and the other before he retires to rest at night. Dog-fanciers generally agree that a dog should be fed but *once* a day.

While thus dieted the animal should have unlimited exercise in the shape of running or walking. I think it as well to mention the shape, as I have heard of a lady whose dog was ill from indigestion, and to which exercise was recommended. At the end of a week the creature's health didn't improve, and the doctor was puzzled. "Is your ladyship quite sure that it has the two hours' daily exercise ordered?" "Quite sure, doctor." "Pray does it run by the side, or walk sluggishly?" "What? walk? Fido walk this nasty weather? How could you think me so cruel, doctor? The pretty fellow is driven through the parks *in the brougham.*" A cold bath, of the sort described elsewhere in this book, is good for a dog suffering from indigestion, as well as tonic sedatives and vegetable bitters.

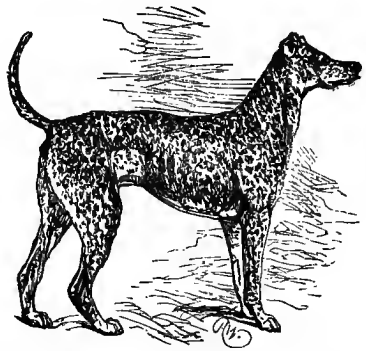
As an ordinary stomach-pill for the dog, Mr. Edward Mayhew recommends the following compound:—Extract of hyoscyamus, sixteen grains; sodæ carb., half an ounce; extract of gentian, half an ounce; ferri carb., half an ounce. To be made into eight, sixteen, or twenty-two pills, according to the size of the indisposed animal, and two to be given daily.

With very old dogs indigestion is accompanied by alarming appearances. The stomach becomes inflated to a degree almost incredible. As the digestive organs are worn out a cure in

such a case cannot be expected, still relief may be given. Liquid, but strengthening food, such as beef-tea, should be given. A weak solution of chloride of lime, or the liquid potassæ, is as good medicine as any. You had better, however, before administering it, let a veterinary surgeon see the dog, that he may instruct you as to the strength and quantity of medicine to be given at a dose.

It may be as well here to give some instruction as to the proper way to give physic to a dog. To give it to a squalling, kicking, refractory child is bad enough, but, in ordinary cases, to see "Sambo" or "Floss" taking its medicine is a sight that would make the fortune of a farce could it be properly put on the stage. It is usually a job for an adult individual, the animal operated upon weighing from eight to twelve pounds: there must be two to hold its feet, one to open its jaws and keep them open, and the other to force the medicine down the patient's throat. The result is that the poor fellow grows dreadfully alarmed and excited, no doubt fully believing that the four ruffians about him are bent on his destruction, and expecting every moment to be dragged limb from limb. Indeed, I have no doubt that a stranger dropping suddenly on the interesting group would have much the same impression. If it is a pill that is to be administered it sticks in the patient's throat, and perhaps a quill-pen is caught up to "push it down." If so the result is certain; how it would be with a human being under such circumstances may be shrewdly guessed, but with a dog the effect is inevitable. Then there is a pretty consternation among the four doctors. If it is a draught, the jaws are held open and the liquid poured in; but there it remains at the back of the mouth, not a drop going down the throat, and the patient's eyes growing wilder and wilder every moment. "Let him go," says the tender-hearted person at the fore-legs, "he is being suffocated," and that he may have no hand in the murder he lets those members free, whereon the patient makes the best of his fore-claws on the jaw-holder's hands, and *he* lets go; and all the time and struggle and sixpenny draught have gone for nothing. By the bye, it should be added, that, funny as this may read, it is a dreadful business for "Sambo," who would, doubtless, if he knew the nature of his ailment—indigestion, dropsy, mange, —cheerfully endure it, or anything else short of hydrophobia, rather than submit once more to the dreadful physicking.

All this fuss, however, may be avoided. There are several



DALMATIAN, OR PLUM-PUDDING DOG.

ways of managing, but the best of any are those recommended by a gentleman to whom I have referred till I am almost ashamed to do so once more. I allude to Mr. E. Mayhew, and unless all his kind-heartedness is devoted to the canine race (and really it must be exhaustless if this be not the case), I think I may hope for forgiveness.

"A small dog should be taken into the lap, the person who is to give the physic being seated. If the animal has learnt to fight with its claws, an assistant must kneel by the side of the chair and tightly hold them when the dog has been cast upon his back. The left hand is then made to grasp the skull, the thumb and fore finger being pressed against the cheeks so as to force them between the posterior molar teeth. A firm hold of the head will thus be obtained, and the jaws are prevented from being closed by the pain which every effort to shut the mouth produces. No time should be lost, but the pill ought to be dropped as far as possible into the mouth and, with the finger of the right hand, it ought to be pushed the entire length down the throat. This will not inconvenience the dog. The epiglotis is of such a size that the finger does not excite a desire to vomit; and the pharynx and œsophagus are so lax that the passage presents no obstruction.

"When the finger is withdrawn the jaws ought to be clapped together and the attention of the creature diverted. The tongue being protruded to lick the nose and lips will certify that the substance has been swallowed, and after a caress or two the dog may be released. Large brutes, however, are not thus

easily mastered. Creatures of this description must be cheated, and they fortunately are not as naturally suspicious as those of a smaller kind. The dog bolts its food, and unless the piece is of unusual size is rarely masticated. The more tempting the morsel the more easily is it gorged; and a bit of juicy or fat meat, cut so as to contain or cover the pill, ensures its being swallowed. Medicine which in this manner is to be administered ought to be perfectly devoid of smell, or for a certainty the trick will be discovered. Indeed, there are but few drugs possessed of odour which can be long used in dog practice, and even those that are endowed with much taste cannot be continually employed.

"Fluids are perhaps more readily given than solids to dogs. To administer liquids the jaws should not be forced open and the bottle emptied into the mouth, as when this method is pursued the greater portion will be lost. The animal's head being gently raised, the corner of the mouth should be drawn aside so as to pull the cheeks from the teeth. A kind of funnel will thus be formed, and into this a quantity of medicine equal to its capacity should be poured. After a little while the fluid will, by its own gravity, trickle into the pharynx and oblige the dog, however unwilling it may be, to swallow. A second portion should then be given in the like way, and thus little by little the full dose is consumed. Often dogs treated in this fashion swallow a draught very expeditiously; but others will remain a considerable time before they deglutate. Some, spite of every precaution, will manage to reject the greater part, while others will not waste a drop.

"Two pieces of tape, one passed behind the canine teeth of the upper, and the other in like manner upon the lower jaw, have been recommended. The tapes are given to an assistant, who pulling on them forces the mouth open and holds it in that position. In certain cases this may be adopted for pills; indeed, every stratagem will be needed to meet the multifarious circumstances that will arise. For ordinary circumstances, however, the practice is not to be commended, and should never be embraced when drinks are to be given: the animal cannot swallow while the jaws are held asunder; but for solids the plan answers better. There are several objections, however, to be urged against its constant use. The operation is violent, and the restraint it necessitates not alone prevents the poor animal deglutating fluids, but also terrifies it, and on the next occasion it will be more resistful. Difficulties therefore increase

and the dog generally is not long before it baffles the efforts to confine it. Moreover, unless the assistant be very well up to his business his steadiness cannot be depended on, and the hand often is wounded by the teeth of the patient."

PARALYSIS.

This is another result of over-feeding, and before all others affects those pets which are so pretty, so interesting, that freedom of the dining and breakfast rooms is accorded them. The consequence is they have never done eating. In just as many meals as the family partake of they participate, and that almost without the knowledge of a single person at the table; that is, without a single person being aware that at each meal the dog eats as plentifully as himself. Each one is ready to declare that "Fido" has only had "the least bit in the world," and that—allowing, of course, for the extravagance of common parlance—is true as regards each individual's experience. The secret, however, is that from each Fido *has* only received one—or two—of the "least bits in the world," but then the persevering little mendicant has been the round of the board and obtained, perhaps, six or seven contributions. He grows fat, monstrously fat, he is such a funny little barrel of a dog it is quite ludicrous to watch him.

Some fine day, however, the "funny little barrel" is discovered floundering about the carpet, seemingly well enough in all other respects, but with his hind legs trailing and benumbed and evidently useless for locomotive purposes. The dog is hurt, been squeezed in a door, or had some piece of heavy furniture thrown down on his loins! All a mistake; therefore do not blame John or Mary for the calamity, or give them warning for "concealing the truth." The truth is patent: the poor beast is paralyzed in its hind legs.

To cure this, have prepared the following prescription:—Ol. Ricini, 4 parts; Ol. Olivæ, 2 parts; Ol. Anisi, q. s.; mix.

Administer this with a cathartic pill every day till the limbs are restored to their healthy action, and for a few days afterwards. Do not, however, be induced by the easy cure of the first attack to renew the patient's unnatural mode of feeding. If you do, he will certainly be again attacked, and again and again—the chances of recovery diminishing with every attack, till there comes one that defies all the medical skill in the kingdom.

DISTEMPER.

It unfortunately happens that this ugly disorder is not easy of detection in its early stages. Sometimes it starts with watery eyes and a short cough; at others, by the same sort of desire to be alone and secluded, and the same peevishness that heralds the all-dreaded disease, hydrophobia, marks its advent. If, however, in addition to these or any other unusual symptoms, there should be a redness about the eyelids, and the dog's body should feel dry and feverish, you may make up your mind as to what is about to happen.

As to the origin of distemper, doctors disagree. Some—in fact, nearly all canine physicians of the old school—assert that it is contagious. Modern men of science declare that such is not the case. The old school doctrine, too, was that every dog *must* have distemper, as infallibly as that every child has measles and hooping-cough. This also is denied, and not without sound proof by the wise men of the nineteenth century. "Cold, wet, bad food, foul air, excessive exertion, fear, &c., are grouped together and put forth as causes of this disorder; but it has yet to be proved that these accepted terms have any connection with it. Dogs that are starved, neglected, or cruelly tortured; animals that are judiciously fed, properly housed, and sensibly treated—as well as favourites that are crammed, nursed, and humoured—are equally its victims; and those that are most cared for fall most frequently, while those that are least prized most generally survive. If, therefore, privation or exposure be of any importance, the fact seems to infer their tendencies are either to check or mitigate the evil."

The symptoms the dog may exhibit during the prevalence of the disease are wonderfully numerous. There is not a single inch of his body, from his head to his tail, but may seem to be the part suffering especially. The eyes sometimes, indeed generally, are very bad. Indeed, it is by these organs that the owner may tell whether his dog is really cured of distemper, or whether the disease, instead of taking its departure, is merely at rest to break out immediately with renewed fury. It will frequently happen that after the dog has exhibited a few of the milder characteristics of the disease it will disappear even more rapidly than it developed itself, and, better than all, leave the patient much better than it found him. His eyes look brilliant and transparent, his nostrils are dry and comfortable, his coat clean and glossy, and his spirits not only high, but actually

boisterously unruly. He does not shiver, and eats like an Arctic wolf. The dog's master is rejoiced, and in the height of his satisfaction he speaks scornfully of the disease that lately afflicted his pet. "Pshaw! this is distemper, is it, that people make such fuss about? Why, it is nothing at all; if anything, just a salutary ailment that clears the system and sets the dog up with a new stock of health." Softly, good sir. Does your dog, that grew so wofully thin over that "salutary" ailment, grow fat? It is not sufficient that the diminution ceases; does he increase in bulk *visibly* and day by day? Look under the upper eyelid; is it clear and healthy, or thickly marked with minute red veins? Unless these two questions can be answered satisfactorily, do not say your dog is well; and if within a week, or even within a month, he should grow suddenly and dreadfully ill, and, after exhibiting a complication of perplexing symptoms, die, do not attribute the death to fits, to some physical injury, or to the malicious and poisonous designs of your servant or neighbour. The simple truth is, the supposed poisoning was nothing but the second stage of distemper.

As before stated, the eyes sometimes suffer very much during this disorder. The pupils seem to fade and blanch, the lids are nearly closed, and the dog seems blind. Possibly it is. Its lungs may be affected. On applying the ear to the animal's chest a harsh wheezing may be detected, denoting something very wrong in the interior. The poor creature is constantly shivering and has a wearying cough. A viscid matter impedes the passage of breath through the nostrils, and the paws are ever busy tapping and rasping at the unfortunate nose, sometimes coaxingly and sometimes irritably, as though the poor wretch felt aggrieved that this, his leading organ, should serve him so. Besides these there are many other dreadful symptoms, a description of which would look so far from pretty in print that I must leave them for the dog-owner to discover.

Six weeks is the average continuance of the attack, though the owner of the animal will know before that time if it will live or die. The following are bad signs. Steady dwindling of bulk, while at the same time the patient has a ravenous appetite. A *very* harsh and *very* inodorous coat, the latter leaving a taint on the hand that is passed over it. The tongue furred, almost lead-coloured, and red and dry at its tip and edges. All these things are ominous. So is a prevalence of vermin in the dog's fur, especially if fleas or other parasites appear very suddenly and swarm in great number. The

worst symptom of all is when the breath is exceedingly hot and foul, and when the belly and the extremities feel cold to the touch. Even then, however, so long as it keeps on its legs and is able to walk there may be a chance of recovery.

"During the recovery from distemper, small and delicate animals, terriers and spaniels, are very liable to faint. The dog is lively, perhaps excited, when suddenly it falls upon its side and all its limbs stiffen. A series of these attacks may follow one another, though generally one only occurs; when numerous and rapid there is some danger, but as a general rule little apprehension is to be entertained. The fainting fits are of some consequence if they exist during a sickening for or maturing of distemper. In pups that have not passed the climax of the disease they are not unseldom the cause of death; but even in that case I [Mr. Mayhew] have never been convinced that the measures adopted for the relief did not kill quite as much or even more than the affliction. When the symptom is mistaken and the wrong remedies are resorted to, the fainting fits will often continue for hours or never be overcome. When let alone the attack does not last, as a rule, more than a quarter of an hour, and under judicious treatment the consciousness almost immediately returns. When the fainting fits occur during the progress or advance of the disease, that is, before the symptoms have begun to amend, it is usually preceded by signs of aggravation. For twelve or twenty-four hours previously the dog is perceptibly worse; it may moan or cry, and yet no organ seem to be more decidedly affected than before. I attribute the sounds made to headache, and, confirming this opinion there is always some heat at the scalp. The uncertain character of the disease renders it a difficult matter to lay down laws for its treatment; there can be no doubt, however, that food and exercise have much influence over the complaint, in whatever shape it may appear. Everything sweet and everything fat must be rigorously withheld. Skim-milk even is preferable to new, and ship-biscuit to be chosen before wheaten bread. If these two latter articles can be procured a more wholesome dish of bread and milk may be prepared with them than with any other. Boiled rice may be given in considerable quantity, moistened—and this is the extreme limit as regards animal food—with broth from which every particle of fat has been skimmed. Whatever the sop consist of let it be COLD before offered to the sick animal."

Should the disease appear to be conquered your care of the

animal must not cease. Its diet must still be scrupulously regulated, and the following tonic pill prepared:—Disulphate of quinine, one to four scruples; sulphate of iron, one to four scruples; extract of gentian, two to eight drachms; powdered quassia, a sufficiency. Make into twenty pills and give three daily. This is Mr. Mayhew's prescription, as indeed are all the others contained in this chapter.

It will sometimes happen in distemper cases that the animal, irritated beyond control by the violent itching of a particular member,—either of its feet or tail,—will commence to nibble at it with his teeth. Nor will he stop at nibbling, but proceed to downright gnawing. A dog has been thus known to consume the first two joints of his tail. Applications of nauseous drugs to the itching parts are sometimes recommended as a preventive, but the best remedy is to encase the offending member in a socket of leather, of the same substance say as gentlemen's boot-tops are made.

With regard to the animal's eyes, however bad they may appear, do not meddle with them. According to the best authority all water, either warm, tepid, or cold, every kind of lotion, or any sort of salve or powder, will do harm, either by weakening or irritating the organs of sight. Nature, if left to herself, will probably restore the animal's eyes to their former perfection, but any meddling with them will certainly put it to great pain and not improbably destroy the sight, or at least leave on the eye a white seam to remind you of your folly.

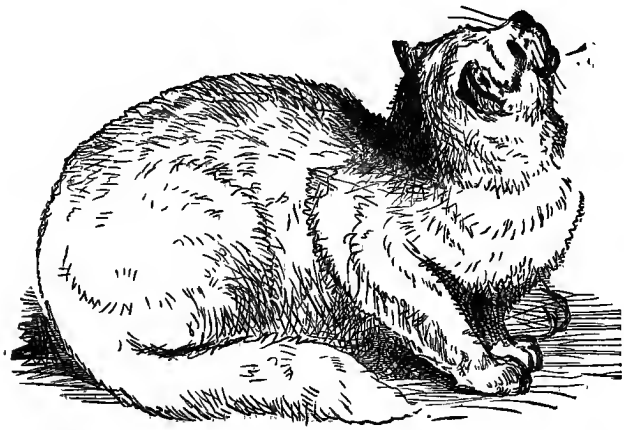
LAWS RESPECTING DOGS AND DOG-KEEPING.

The keeping of vicious or destructive dogs, except under proper precautions, is illegal, and the owner of the offending animal is liable for the damage done unless it can be clearly shown that the fault lay with the party injured. Measures of precaution may be enforced against dogs suspected to be savage. If a man have a dog which he suspects to be of a savage nature and addicted to bite, and he allow it to go in a frequented place without being muzzled or otherwise guarded, so as to prevent its committing injury, he may be indicted, in England, as for a common nuisance. If the dog be of a ferocious kind, as a mastiff, it has been held that it must be muzzled, and it will be no defence in an action of damages against the master that the person injured trod on the dog's toes, for he would not have trod on them if they had not been

there. The harbouring of a dog about one's premises, or allowing him to resort there, will warrant indictment. If a dog known to his proprietor to have previously bitten a sheep be retained by him, the proprietor will be liable for all other injuries even to any other animals, *e.g.*, a horse ("Burn's Justice of the Peace," vol. ii., p. 333). An interdict may be granted against a dog going loose pending a discussion of the question as to whether or not he ought to be killed. Many local police acts contain provisions as to shutting up or muzzling dogs during the prevalence of weather likely to produce hydrophobia; and where such do not exist the subject may be dealt with by a magistrate at common law. Dog-stealing is a misdemeanour punishable, on summary conviction, for the first offence by six calendar months' imprisonment and hard labour, or fine not exceeding twenty pounds above the value of the dog. The second offence is an indictable one punishable by fine and imprisonment and hard labour not exceeding eighteen months, or both. Similar punishment is provided for persons having in their possession dogs or dog-skins, knowing them to be stolen. A dog going into a neighbour's field does not afford ground for an action of trespass unless he does mischief; and even then the person who kills him may, in certain circumstances, be liable for damage.

Any person, not being the owner, or acting under authority, who administers a poisonous or injurious drug or substance to a dog is liable to fine and imprisonment with hard labour; but the magistrate may take into consideration any reasonable cause or excuse.

The duty charged on every dog over six months old (with the exceptions hereafter stated) is seven shillings and sixpence annually, for which sum a licence is issued. Dogs used solely for the guidance of a blind person are exempt. Dogs used for the purpose of tending sheep or cattle on a farm and shepherds' dogs are also exempt; but the exemption only extends to three dogs for four hundred sheep on common or unenclosed land, to four dogs for a thousand sheep, and to an additional dog for every five hundred sheep over that amount; but no more than eight dogs altogether will be exempted. A shepherd can keep only two dogs free of duty. A master of hounds may claim exemption for whelps under a year old, which have never been used for hunting.



CATS.

THE WILD CAT.

THAT the wild cat was in ancient times plentiful in Britain, and moreover set down in the category of beasts of chase, is proved by the fact that in a charter granted by Richard II. to the Abbot of Peterborough, permission is given him to hunt the hare, fox, and wild cat. Except, however, in certain forests in Cumberland and Westmorland, it is now seldom or never met in England; and even in the districts mentioned, and where some few centuries back it abounded, it is a rare thing to meet a wild cat. In Scotland, however, and certain parts of Ireland it is still occasionally found. The following narrative, furnished by Mr. St. John, will demonstrate the sort of creature it is to encounter:—

"Once, when grouse shooting, I came suddenly, in a rough and rocky part of the ground, upon a family of two old and three half grown wild cats. In the hanging birch woods that bordered some of the highland streams and rocks the wild cat is still not uncommon; and I have heard their wild and unearthly cries echo afar in the quiet night as they answer and call to each other. I do not know a more harsh and unpleasant cry

than the cry of the wild cat, or one more likely to be the origin of superstitious fears in the mind of an ignorant Highlander. These animals have great skill in finding their prey, and the damage they do to the game must be very great, owing to the quantity of food which they require. When caught in a trap they fly without hesitation at any person who approaches them, not waiting to be assailed. I have heard many stories of their attacking and severely wounding a man when their retreat has been cut off. Indeed, a wild cat once flew at me in a most determined manner. I was fishing at a river in Sutherlandshire, and in passing from one pool to another had to climb over some rocky and broken ground. In doing so I sank through some rotten moss and heather up to my knees, almost upon a wild cat who was concealed under it. I was quite as much startled as the animal herself could be when I saw the wild looking beast rush out so unexpectedly from between my legs with every hair on her body standing on end, making her look twice as large as she really was. I had three small sky-terriers with me, who immediately gave chase and pursued her till she took refuge in a corner of the rock, where, perched in a kind of recess out of reach of her enemies, she stood with her hair bristled out, and spitting and growling like a common cat. Having no weapon with me I laid down my rod, cut a good sized stick, and proceeded to dislodge her. As soon as I came within six or seven feet of the place she sprang right at my face, over the dogs' heads. Had I not struck her in mid-air as she leapt at me I should probably have got some severe wound. As it was, she fell with her back half broken amongst the dogs, who with my assistance dispatched her. I never saw an animal fight so desperately, or one so difficult to kill. If a tame cat has nine lives a wild cat must have a dozen."

The colour of the wild cat is more uniform than that of the domestic species. On a ground colour of pale reddish-yellow are dark streaks extending over the body and limbs, forming pretty much the sort of pattern exhibited on the tiger's robe. From the back of the neck to the spine a line of very dark spots extend to the tail, which is short and bushy, and has a black tip. The feet and insides of the legs are yellowish grey. In the female—which is smaller than the male—the colours are not as distinct. The medium size of a full-grown male wild cat is as follows:—Length of head and body, 1 foot 10 inches; length of head, 3½ inches; length of ears, 2 inches and

an eighth; length of tail 11 inches. The wild cat affects rocky and densely wooded districts, living in holes or in hollow trees. According to Mr. St. John a wild cat will sometimes take up its residence at no great distance from a house, and entering the hen-houses and out-buildings carry off fowls or even lambs in the most audacious manner. Like other vermin, the wild cat haunts the shores of lakes and rivers, and it is therefore easy to know where to lay a trap for it. Having caught and killed one of the colony the rest of them are sure to be taken, if the body of their slain relative be left in some place not far from their usual hunting ground, and surrounded with traps, as every wild cat who passes within a considerable distance of the place will to a certainty come to it.

The wild cat of Ireland would seem to be quite as savage a fellow as his Scotch cousin. In Maxwell's "Wild Sports of the West" is a story of one of these animals which was killed after a severe battle. It was of a dirty grey colour, double the size of the common house cat, and with formidable teeth and claws. It was a female, and was tracked to its burrow under a rock and caught with a rabbit net. So flimsy an affair, however, was scorned by the fierce brute, which speedily rent a hole with its teeth and claws and was about to run off, when the lad who had set the snare seized it by the neck. He was a brave lad, and there was a tremendous fight, the wild cat being finally dispatched by a blow of an iron spade. The lad, however, was so terribly wounded as to necessitate his removal to an hospital, where he for some time remained under terror of lock-jaw.

The wild cat is more plentiful in the wooded districts of Germany, Russia, and Hungary, than in any other parts of Europe. It is found also in the north of Asia and in Nepaul.

Beside the true wild cat there are other species of *Felis* who, on account of their resemblance to the tiger, are called tiger-cats. They are found in all parts of the world with the exception of Europe. The largest of this family is the Rimau-Dahan, an inhabitant of Sumatra. When full grown it measures over seven feet from the nose to the tip of its tale, which appendage, however, monopolizes three feet six of the whole. It is nearly two feet high at the shoulders. Its colour is light grey, striped and spotted with jet black. One of the first specimens of this tiger cat seen in England was brought here by Sir Stamford Raffles, who procured two of them from the

banks of the Bencoolen river. "Both specimens," writes this gentleman, "while in a state of confinement were remarkable for good temper and playfulness; no domestic kitten could be more so; they were always courting intercourse with persons passing by, and in the expression of their countenance, which was always open and smiling, shewed the greatest delight when noticed, throwing themselves on their backs and delighting in being tickled and rubbed. On board the ship there was a small dog who used to play round the cage and with the animals, and it was amusing to observe the playfulness and tenderness with which the latter came in contact with his inferior sized companion. When fed with a fowl that died he seized the prey, and after sucking the head, and tearing it a little, he amused himself for hours in throwing it about and jumping after it, in the manner that a cat plays with a mouse before it is quite dead. He never seemed to look on man or children as his prey; and the natives assert that when wild they live chiefly on poultry, birds, and small deer."

The Colocolo is another tiger-cat. It is an inhabitant of Guiana, and though not more than a third the size of the Rimau-Dahan, is a most formidable enemy to the smaller animals of the forests which it inhabits. It is related by Mr. Wood that a specimen of this creature was shot on the banks of a river in Guiana by an officer of rifles, who stuffed it and placed the skin to dry on the awning of his boat. As the vessel dropped down the river it passed under overhanging boughs of large trees on which rested numerous monkeys. Generally when a boat passed along a river the monkeys which inhabit the trees that border its banks displayed great curiosity, and ran along the boughs so as to obtain a close view of the strange visitant. Before the Colocolo had been killed the passage of the boat had been attended as usual by the inquisitive monkeys, but when the stuffed skin was exhibited on the awning the monkeys were horribly alarmed, and instead of approaching the vessel as they had before done, trooped off with prodigious yells of terror and rage. From this universal fear which the sight of the animal occasioned to the monkeys, it may be conjectured that the Colocolo is in the habit of procuring its food at the expense of the monkey tribes.

Of the tiger-cat of Africa, the Serval may be taken as the type It is about two feet long, exclusive of the tail which measures nine inches, and is a foot in height at the shoulders.

Its upper parts are clear yellow, and its under parts white, and its entire body is spotted with black. Among the natives it is known as bosch-katte, or bush cat. It is an inoffensive creature, not easily irritated, and behaving generally like our own familiar grimalkin.

America has several tiger-cats, foremost amongst which may be mentioned the Ocelot. Two of these animals were kept at the Tower of London at the time when that ancient fortress counted a menagerie among its other attractions, and of one of these Mr. Bennett gives the following description:—

"Body when full grown nearly three feet in length; tail rather more than one foot; medium height about eighteen inches. Ground-colour of fur gray, mingled with a slight tinge of fawn, elegantly marked with numerous longitudinal bands, the dorsal one continuous and entirely black, the lateral (six or seven on each side) consisting for the most part of a series of elongated spots with black margins, sometimes completely distinct, sometimes running together. The centre of each spot of a deeper fawn than the ground-colour external to them; this deeper tinge is also conspicuous on the head and neck, and on the outside of the limbs, all of which parts are irregularly marked with full black lines and spots of various sizes. From the top of the head between the ears, there pass backwards, towards the shoulders, two or more, frequently four uninterrupted diverging bands, which inclose a narrow fawn-colour space with a black margin; between these there is a single longitudinal, somewhat interrupted, narrow black line, occupying the centre of the neck above. Ears short and rounded, externally margined with black, surrounding a large central whitish spot. Under parts of the body whitish, spotted with black, and the tail, which is of the same ground-colour with the body, also covered with black spots."

This animal is a native of Mexico and Paraguay. Its home is the gloomiest depths of the forest, where all day long it lies quiet but, as night advances, comes out to prey on birds and small quadrupeds. It is said to be a particularly cunning creature, and sometimes, when other stratagems to replenish his larder have failed, to stretch himself all along the bough of a tree and sham death. The monkeys of the neighbourhood have no greater enemy than the ocelot; therefore, it is only natural that when they find him dead they should be much rejoiced, and call together their friends and relations to see the pretty sight. The treacherous ocelot is, however, meanwhile

keeping sharp watch through a tiny chink of his eyelids, and when the rejoicing is at its highest up he jumps, and, before the monkey-revellers can recover from their fright, at least a couple will feel the fatal weight of his paw.

There are several ocelots—the painted, the grey, and the common, among others. In captivity few animals are more surly and spiteful until they grow thoroughly well-acquainted with their keepers, or others who court their notice. There is, however, one weapon keener than the sharpest sword, more potent than the Armstrong gun, more powerful than all the gunpowder and bullets ever made, and yet so simple that the boy yet in pinafores may direct it: to this weapon the suspicious tiger-cat succumbs, and the name of this weapon is KINDNESS. So armed, the Rev. J. G. Wood conquered a body of ocelots exhibited at the menagerie. He says, "Several of these animals, when I first made their acquaintance, were rather crabbed in disposition, snarled at the sound of a strange step, growled angrily at my approach, and behaved altogether in a very unusual manner, in spite of many amicable overtures.

"After a while, I discovered that these creatures were continually and vainly attempting the capture of certain flies which buzzed about the cage. So I captured a few large bluebottle flies, and poked them through a small aperture in the cage, so that the ocelot's paw might not be able to reach my hand. At first the ocelots declined to make any advances in return for the gift; but they soon became bolder, and at last freely took the flies as fast as they were caught. The ice was now broken, and in a very short time we were excellent friends; the angry snarl being exchanged for a complacent purr, and the suspicious, lurking movement for a quiet and composed demeanour. The climax to their change of character was reached by giving them a few leaves of grass, for which they were, as I thought they would be, more anxious than for the flies. They tore the green blades out of my hand, and retired to their sleeping-house for the purpose of devouring the unaccustomed dainty undisturbed. After this, they were quite at their ease, and came to the front of the cage whenever I passed."

ANTIQUITY OF THE CAT AS A HOME PET.

Although cats appear to have been known in all parts of the world from the most remote age, nowhere do they seem to have held so high a position as in Egypt. Says an ancient

scribe, "In Egypt the cat was held in the greatest veneration, and when it died a natural death it was actually mourned for with demonstrations of grief appointed for the event, and that if the death were caused by malice the murderers were condemned to be given over to the rabble to be buffetted to death." And elsewhere we read that "Cambyses, who succeeded his father Cyrus as king of Persia, about the year 530, availing himself of the regard of the people for their favourite animals, when he invaded Egypt to punish Amasis for an affront, made himself master of Pelasis which had before successfully resisted his arms. The stratagem he adopted was certainly an ingenious one; he gave a live cat to each of his soldiers instead of a buckler, and the Egyptian soldiers rather than destroy these objects of their veneration suffered themselves to be conquered." Mourief mentions that an insult offered to a cat by a Roman was once the cause of an insurrection among the Egyptians, even when the fact of their own vanquishment could not excite them to rebel. If other evidence were wanting, the enormous quantity of cat relics discovered in Egypt, buried with as much care as though they had been grandees of the land, or preserved by the tedious and expensive process of embalming, would afford ample proof of the esteem in which the Egyptian cat was held.

The Turks are great admirers of cat kind. When Baumgarten visited Damascus he found a spacious hospital whose sole inmates were sick cats and their nurses; and when he inquired as to the origin of the institution he was informed that Mahomed, when he had once lived there, brought with him a favourite cat which he kept in the sleeve of his garment and carefully fed with his own hands, taking off his sleeve rather than disturb the repose of his pet; therefore his followers paid superstitious respect to these animals, and supported them in this manner by public alms, which were found to be sufficient.

In this and the sister kingdom the cat has been held in high respect since a very early age. "Our ancestors," says Pennant, "seem to have had a high sense of the utility of this animal. That excellent prince Howel Dda, or Howel the Good, did not think it beneath him, among his laws relating to the prices, &c., of animals, to include that of the cat, and to describe the qualities it ought to have. The price of a kitling before it could see was to be a penny; till it caught a mouse, twopence. It was required besides that it should be perfect in its senses of

hearing and seeing, be a good mouser, have the claws whole, and be a good nurse; but if it failed in any of these qualities the seller was to forfeit to the buyer the third part of its value. If any one stole or killed the cat that guarded the prince's granary he was to forfeit a milch ewe, its fleece, and lamb; or as much wheat as when poured on the cat suspended by its tail (the head touching the floor) would form a heap high enough to cover the tip of the former. This last quotation is not only curious, as being an evidence of the simplicity of ancient manners, but it almost proves to a demonstration that cats are not aborigines of these islands, or known to the earliest inhabitants. The large prices set on them (if we consider the high value of specie at that time) and the great care taken of the improvement and breed of an animal that multiplies so fast, are almost certain proofs of their being little known at that period."

It was the custom of Cardinal Wolsey to accommodate his favourite cat with part of his regal seat, and this even when he held audiences or received princely company. Petrarch, the great Italian poet, made a home pet of grimalkin, and after its death paid it the questionable honour of embalming, and placed it in a niche in his studio. Godefroi Mind, the celebrated painter, and who was styled the "Raphael of Cats," from his making them his almost constant study, maintained a large staff of these animals, and it is related of him that when, at one time, the hydrophobia was prevailing in Berne, so that a vast number of the cats of the city were by order of the magistrate put to death, poor Godefroi Mind was so deeply affected that he was never afterwards completely consoled. He contrived to hide his chief favourite until the panic was passed, and he always worked at his easel talking to her, and was generally found with her and her family, either on his knees or on his chair, whenever his friends entered the room.

Great, wise, sour Doctor Johnson kept a cat. The doctor's cat once fell sick, and refused its diurnal cat's-meat. In the midst of his distress on pussy's account, he discovered that the dainty feline appetite might be tempted by an oyster. Acting on the hint, he went out and bought oysters for his cat, and continued to visit the oyster-stall every day till the animal grew well.

The poet Gray had a cat that came to an untimely end. She, however, was not allowed to go the way of other cat-flesh—to be put into a hole and thought no more of. So much affec-

tion had the poet for his pet, that he composed to her memory the following verses:

ON THE DEATH OF MY FAVOURITE CAT, DROWNED IN A VASE OF GOLD FISH.

'Twas on a lofty vase's side,
Where China's gayest arts had dyed
The azure flowers that blow,
Demurest of the tabby kind,
The pensive Selima reclined,
Gazed on the lake below.

The conscious maid her joy declared;
The fair round face and snowy beard,
The velvet of her paws,
Her coat that with the tortoise vies,
The ears of jet, and em'rald eyes,
She saw, and purr'd applause.

The hapless nymph with wonder saw
A whisker first, and then a claw,
With many an ardent wish;
She stretch'd in vain to reach the prize—
What female heart can gold despise?
What cat's averse to fish?

Presumptive maid! with looks intent,
Again she stretch'd, again she bent,
Nor knew the gulf between.
Malignant Fate sat by and smiled,
The slippery verge her feet beguiled—
She tumbled headlong in.

Eight times emerging from the flood,
She mewed to every watery god
Some speedy aid to send.
No dolphin came, no neriad stirr'd,
No cruel Tom nor Susan heard,—
A fav'rite has no friend.

Learn hence, ye beauties undeceived,
Know one false step is ne'er retrieved,
And be with caution bold;
Not all that tempts your wondering eyes
Nor heedless hearts, is lawful prize,—
Nor all that glitters gold.

In ancient times, much as the cat was esteemed in England, it was certainly viewed with quite as much awe as admiration. One is apt to smile when he reads that in Egypt, when the family cat gave up the ghost, it was customary for the entire household to shave off their eyebrows as a token of their poignant grief; but surely this was not nearly so absurd as to regard grimalkin as the most favourite form assumed by the prince of darkness when he happened to have business on the face of the earth. If there lived in any part of the country a solitary woman, who through ripe age had become wrinkled

and lean and wizen-faced, it was to her the people looked when a cow died, or a child took the croup, or the apple-trees were blighted. The old woman would be watched, and if it were discovered that the companion of her solitude was a cat, especially a *black* cat, no further evidence was required. She was a witch without a doubt; well versed in the black-art—thanks to the teachings of the black cat—and capable of performing equestrian exercise on a broomstick, or by a glance of her poor old bleared eyes of killing a cow at a longer range than could be accomplished by the most perfect of modern rifles. This seems like a joke now, but, in sober earnest, there *was* a time—Matthew Hopkins was then alive—when on no better proof of witchery than above given, many a grey-headed man and woman has been strangled by drowning or consumed by fire.

Sailors are very superstitious as regards cats. Should the ship cat be inclined for fun, and scud and bustle and rush about as cats will, old mariners will wag their heads and whisper of a coming storm. Nor may the landsman laugh at Jack Tar; for how often may we hear—especially if grandmother is on a visit—"see the cat is washing its face; we shall shortly have rain."

Our forefathers, in the wisdom which distinguished the "good old times," were firm believers in the medicinal properties of the cat; and any part of the animal, from the tip of its nose to the extremity of its caudal appendage, was considered efficacious in the cure of diseases. If, for instance, a person has a whitlow on the finger, he will find a sure remedy by acting as follows:—Of course it is understood that the whitlow is caused by a worm; then all you have to do is to put your forefinger into the ear of a cat for a quarter of an hour every day, and in a few days, by this means, the worm which causes the whitlow will not be able to wriggle, and, of course, if the worm cannot wriggle, it *must* die, and the finger will then soon get well! To the ingenious discoverer of the above remedy we are perhaps indebted for the following "certain cure" for epilepsy:—Take a penknife, cut the vein under a cat's tail, take *three drops* of blood therefrom, put it into a glass of water, swallow it quickly, and in a few days all disease will have vanished! To prevent weak eyes:—Take a black cat's head, burn it to ashes, and blow a little of the dust in the eyes three times a day. Be careful in performing any of the above operations, for if a person swallow a single cat's hair he will immediately go into a fainting fit!

In the apothecaries' shop-windows of a century or two ago might have been seen a label, on which was inscribed, "*Axungia cati sylvestris.*" This, dear reader, simply meant that wild cat's fat might be obtained within, as a certain cure for lameness, epilepsy, &c.

There appears to be little doubt, however, that as a minister to certain of the ills to which flesh is heir, the cat is not to be despised; especially in cases where electricity is of good service. The electrical character of the cat is a very well ascertained fact. A cold bright day is the best time to convince oneself of the truth of this. Not only will a crackling be heard, and a spark seen, but, if the experiment be properly conducted, a positive shock may be obtained. The animal should be placed on the knees, the operator placing one hand on its breast, while the other hand is engaged stroking the fur of her back. In a short time crackling will be heard, and sparks seen, and the person stroking the cat experiences a smart shock above the wrists. I do not state this on my own experience—I have tried it several times but never with any decided success. I am convinced, however, that the fault lay with me and not with the cat. The Rev. J. G. Wood attests that the above given directions, if faithfully followed, will be followed by satisfactory results, and gives an instance of the electricity of the cat as exhibited in his clever and interesting cat "Pret." If a hair of her mistress's head were laid on Pret's back, the cat would writhe about on the floor and put her body into violent contortions, and would endeavour with all her might to shake off the object of her fears. Even the mere pointing of a finger at her side was sufficient to make her fur bristle up and set her trembling, though the obnoxious finger were at a distance of six inches from her body."

The same gentleman goes on to express an opinion that on account of the superabundance of electricity which is developed in the cat, the animal is found very useful to paralyzed persons, who instinctively encourage the approach of a cat and derive a gentle benefit from its touch. Those who are afflicted with rheumatism often find their sufferings alleviated by the presence of one of these electrically gifted animals.

ORIGIN OF THE DOMESTIC CAT.

The origin of the domestic cat is not at all clearly ascertained. By many writers it is asserted to be a variety of the wild cat of Europe and Northern Asia; and a talented writer

in a series of popular books, published originally in 1836, lays down the law as follows:—"In this case" (the case of the cat) "unlike that of the dog, there is no doubt which is the original head of the domesticated stock. The wild cat of the European forests is the tame cat of European houses. The tame cat would become wild if turned into the woods. The wild cat at some period has been domesticated, and its species has been established in almost every family of the old and new continent." This argument is, however, not completely correct. The tame cat will certainly "become wild" if turned into a forest; that is to say, it will cease to be gentle and respond to the slavish epithet of "puss;" but really it is no more a *wild cat* than when it dozed on the hearth-rug and drank milk from a saucer. One of the chief points of distinction between the wild and domestic cat is found in the comparative size and length of their tails. In the domestic cat, the tail is long and tapers to a fine point, whereas, in the wild cat, the tail is short and bushy and blunt. Again, the domestic cat is invariably of smaller size than the wild animal, and it is well known that the effect of domestication on animals is to increase their bulk.

The celebrated naturalist, M. Rüppel, discovered in the weedy and bushy regions of Ambukol, west of the Nile, a cat whose size was that of the medium-sized domestic cat, or about one-third smaller than the European wild cat, and having a longer tail than the animal last mentioned. The hair of this animal was long and in colour a blending of dirty-white and yellow. It was M. Rüppel's opinion that this cat was descended from the domestic cat of the ancient Egyptians, now to be traced in the cat-mummies and their representations on the monuments of Thebes. The domestic cat is "le chat" of the French, "Gatto" of the Italians, "Gats" of the Spanish and Portuguese, "Katze" of the Germans, "Kat" of the Dutch and the Danes, "Cath" of the Welsh. It is worthy of remark that all these names are the same as the Latin *Catus*, and this is somewhat in favour of all northern and western Europe having received the cat through Roman navigators, and we are thus brought nearer to Egypt and its probable origin.

Rüppel believed that the Egyptian cat and that which is familiar to us were identical, and Temminck concurs with him. Professor Owen, however, declares emphatically against this doctrine, and gives as the reason this—that in the Egyptian

cat the first deciduous molar-tooth has a relatively thicker crown, and is supported by three roots, whilst the corresponding tooth both of the domestic and wild cat of Europe has a thinner crown and only two roots.

Mr. Bell, in his "History of Quadrupeds," handles the cat question with the same masterly hand as every other he touches. With regard to the favourite belief that the common wild cat is the father of the tame, he states his belief that there are many reasons for believing that this opinion is entirely erroneous. In the first place, he observes, the general conformation of the two animals is considerably different, especially in the length and form of the tail, which in the wild cat is strong, robust, and at least as large towards the extremity as at the base and middle, whilst that of the domestic cat tapers towards the apex. The fur, too, of the former, he remarks, is thicker and longer, and although the colours are somewhat like those which occur in some individuals of the ordinary species, there are, even in this respect, distinctions which can scarcely be considered otherwise than as essentially specific, as, for instance, the termination of the tail in a black tuft which invariably marks the wild cat.

Referring to Sir William Jardine for his opinion on the origin of *Felis domestica*, he suggests that since the introduction of our house cat to this country there may have been an accidental cross with the wild native species, by which the difference in form between the wild and tame cat may be accounted for. "The domestic cat," says Jardine, "is the only one of this race which has been generally used in the economy of man. Some of the other small species have shown that they might be applied to similar purposes; and we have seen that the general disposition of this family will not prevent their training. Much pains would have been necessary to effect this, and none of the European nations were likely to have attempted it. The scarcity of cats in Europe in its earlier ages is also well known, and in the tenth and eleventh centuries a good mouser brought a high price." Although, however, our opinion coincides with that of Rüppel, and we think that we are indebted to the superstition of the ancient Egyptians for having domesticated the species mentioned by Rüppel, we have no doubt that since its introduction to this country, and more particularly to the north of Scotland, there have been occasional crossings with our own native species, and that the results of these crosses have been kept in our houses.

We have seen many cats very closely resembling the wild cat and one or two which could scarcely be distinguished from it. There is, perhaps, no other animal that so soon loses its cultivation and returns apparently to a state completely wild. A trifling neglect of proper feeding or attention will often cause them to depend on their own resources; and the tasting of some wild and living food will tempt them to seek it again, and to leave their civilized home. They then prowl about in the same manner as their conquerors, crouching among corn, and carefully concealing themselves from all publicity. They breed in the woods and thickets, and support themselves upon birds or young animals. Few extensive rabbit-warrens want two or three depredators of this kind, where they commit great havoc, particularly among the young, in summer. They sleep and repose in the holes, and are often taken in the snares set for their prey. I once came upon a cat which had thus left her home; she had recently kittened in the ridge of an uncut cornfield. Upon approaching she showed every disposition to defend her progeny, and beside her lay dead two half-grown leverets.

Looking towards the great Bell for an endorsement of these sentiments we are disappointed. "It is not without much reflection," says he, "that I have come to the conclusion that this opinion of their intermixture is erroneous, and has its foundation in mistaken facts." M. Rüppel is as mercilessly handled as Mr. Jardine. "The Nubian cat," continues Mr. Bell, "to which the high authority of Rüppel has assigned the origin of the house cat, is still farther removed from it in essential zoological character than even the British wild cat, to which it had been previously so generally referred; and that as in the case of so many of our domesticated animals, we have yet to seek for the true original of this useful, gentle, and elegant animal."

VARIETIES OF THE DOMESTIC CAT.

There are not many varieties of this animal in a state of domestication, and they are nearly all enumerated by the mention of the Tortoiseshell, the Chinese, the Blue or *Chartreuse*, the Tabby, the Angola, and the Manx.

The last mentioned—the cat of Manx—is one of the most singular. Its appearance is not prepossessing; its limbs are gaunt, its fur close-set, its eyes staring and restless, and it possesses no tail, that is, no tail worthy to be so called; there

certainly is, where the caudal appendage usually hangs, a sort of knob, suggestive of amputation in early kittenhood; but it is a well authenticated fact that the Manx cat has no tail, and, so far as can be ascertained, never had one. As, says a modern writer, "A black Manx cat, with its staring eyes and its stump of a tail, is a most unearthly looking beast, which would find a more appropriate resting place at Kirk Alloway or the Blocksburg than at the fire-side of a respectable household. So it might fitly be the quadrupedal form in which the ancient sorcerers were wont to clothe themselves on their nocturnal excursions."

The Angola is one of the most beautiful of cats. Its form is ample, its fur long and silky, and its tail remarkably full and brush-like. These cats are very intelligent, and, according to Mr. Wood's experience, possessed of capacious stomachs. While that gentleman was staying at a café in Paris, he made friends with a huge Angola that used to sit on the tables and assist the Englishman in the consumption of his biscuits. She devoured them with such apparent relish that Mr. Wood ordered her a plate of almond biscuits for herself. The plate was speedily emptied and replaced by another; this too was leisurely cleared, the Angola's eyes still beaming with expectation rather than satisfaction. Her worthy patron had, however, settled the point that Angola cats will eat almond biscuits—a very great quantity of them, and was in no humour to experimentalize further.

Hiertro dello Valli makes mention of a cat discovered by him in Persia which exactly answers the description of the Angola. "There is," he says, "in Persia—particularly in the province of Charagan—of the figure and form of our ordinary ones but infinitely more beautiful in the lustre and colour of its skin. It is of a grey blue, and as soft and shining as silk. The tail is of great length and covered with hair six inches long, which the animal throws over its back after the manner of a squirrel."

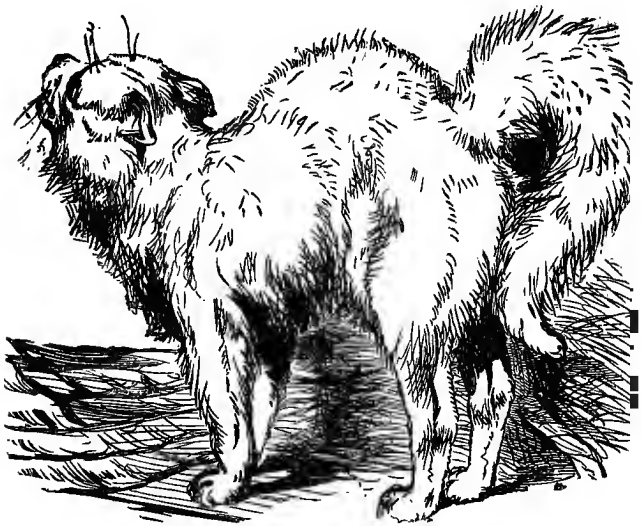
The Chinese cat is of largish size, has fine glossy fur, and is remarkable for its pendulous ears. Some assert that this is not properly a cat at all but a "Samxee," whatever that may be. Bosman, writing about the Chinese cat's drooping ears, remarks: "It is worthy of observation that there is in animals evident signs of ancestry of their slavery. Long ears, long and fine hair, are effects produced by time and civilization, whilst all wild animals have straight round ears." His re-

marks would seem to apply only to such animals as, when in a wild state, depend in a measure for their safety on their acute hearing, but when reduced to domestication, and consequent non-reliance on their own exertions, an exquisite ear is no longer necessary, and so the organ from sheer laxity falls out of shape. The rabbit is a good instance of this, as are lap dogs of various sorts; but it cannot be so said of the cat whose ears after centuries of domestication are as stiff and alert as those of her ancestors, who ran wild in a wood and listened for the stealthy footfall of the rabbit or the rustle of the bird. So it is again with the horse, and evidently because that in domestication they have as much need of their ears as when in a wild condition.

The tortoiseshell, or Spanish cat, may be known from its colours—white, black, and reddish brown—and from its elegant and delicate form; the blue, or Chartreus, cat by its long slate coloured fur, and the bushiness of its neck and tail. It is generally supposed that the "Tabby" coloured cat has a shorter domestic pedigree than any other.

It is the fashion to ascribe to the cat very few good qualities. She is said to be selfish, cruel, greedy, and without an atom of affection; indeed, to be in disposition the very reverse to the dog. Popular opinion may be said to be fairly summarized in the following effusion of a modern writer:—"I do not love the cat—his disposition is mean and suspicious. A friendship of years is cancelled in a moment by an accidental tread on his tail or foot. He instantly spits, raises his rump, twirls his tail of malignity, and shuns you; turning back, as off he goes, a staring vindictive face full of fury and unforgiveness, seeming to say, 'I hate you for ever.' But the dog is my delight. Tread on his tail or foot he expresses for a moment the uneasiness of his feelings, but in an instant more the complaint is ended. He runs around you, jumps up against you, seems to declare his sorrow for complaining, as he was not intentionally hurt; nay, to make himself the aggressor he begs by whinings and lickings that his master will think no more of it."

So much against the cat; now for evidence in favour of the maligned animal, not hearsay evidence but that derived from practical experience and furnished by living witnesses



STORIES OF REMARKABLE CATS.

The writer has, in his time, made the acquaintance of some queerish cats. When quite a little boy there was attached to our house a gaunt black and white cat, whose sole recommendation was that he was a magnificent mouser; nay to such lengths would he carry his passion for hunting as regularly to haunt a ditch that existed in the neighbourhood for the purpose of pursuing and capturing water-rats, which class of vermin it dispatched in a manner that at once secured the death of the rat and himself immunity from the rat's teeth. Seizing the animal by the back of the neck, the cat, by a sudden wriggle, threw himself on his back, at once transferred the custody of the rat from his mouth to his fore-paws, holding it neatly behind the shoulders, while with his hind talons he cruelly assailed the unlucky animal's loins and ribs till it ceased to struggle. I have stated that the cat in question was attached to our house, and that certainly was the extent of his intimacy, for he was attached to nobody residing there. Myself he particularly disliked, and although he never considered it beneath his dignity to steal any article of food from me, would never accept my overtures of friendship. I have reason to believe that his special dislike for me arose out of a

pair of boots possessed by me at that period. They were creaky boots, and fastened with laces. Whether it was that the creaking of the articles as I moved about the room in them reminded him of the squeak of rats, and whether, not being a particularly tidy boy, the before-mentioned laces were sometimes allowed to trail rat's tail wise, aggravatingly heightening the illusion, I can't say; I only know that as sure as I happened to allow my small feet to swing loosely while seated at breakfast or dinner, so surely would the black and white cat, if he were in the room, make a sudden dash at the hated boots, giving my leg a severe wrench in his endeavour to fling himself on his back for the purpose of tearing the life out of them after his own peculiar mode.

My enemy was, however, finally subdued, and in rather a curious way. Some one bought me one of those difficult musical instruments known as a mouth organ, and delighted with my new possession I was torturing it as I sat on a seat in the garden. Suddenly there appeared in a tree just above my head my foe, the black and white cat, with her tail waving from side to side, her eyes staring, and her mouth twitching in an odd sort of way. I must confess I was rather alarmed, and in my nervous condition I might be excused if I construed the expression of the cat's countenance to intimate "Here you are then with another hideous noise, a noise that is even more suggestive of rat squeaking than your abominable boots; however, I've caught you by yourself this time, so look out for your eyes." I did not, however, cease playing my organ; my enemy's green eyes seemed to fascinate me, and my tremulous breath continued to wail in the organ pipes. Slowly the black and white cat descended the tree, and presently leapt at my feet with a bound that thrilled through me, and expelled a scream-like note from my instrument. But, to my astonishment, my enemy did not attack me; on the contrary he approached the offending boots humbly, and caressed them with his head. Still I continued to play, and after every inch of my bluchers had received homage from the cat's hitherto terrible muzzle, he sprang on to the seat beside me, and purred and gently mewed, and finally crept up on to my shoulders, and lovingly smelt at the mouth-organ as I played it. From that day hostilities ceased between us. He would sit on my shoulders for half an hour together and sing, after his fashion, while I played, and I had only to strike up to lure him from any part of the premises where he might happen to be.

There used to come to our house a young man who played the trombone, and having heard the story, insisted that there was nothing in it—that all cats liked music, and that savage as was our cat to strangers, he would be bound to conquer him with a single blast of his favourite instrument. Next time he came armed with the terrible-looking trombone, which our cat no sooner saw than—as I now knew her nature better than any one else could—she took a violent dislike to it. Placing our cat in a favourable position, the young man blew a blast on the trombone; the effect was, as he prognosticated, instantaneous, though not perfectly satisfactory; the brazen note was immediately responded to by one equally loud from our cat, who appeared to regard it as a challenge to combat, and thickened his tail and bared his teeth accordingly, at the same time swearing and spitting dreadfully. I need not say that the trombone player was discomfited, while my fame as a cat-charmer was considerably augmented.

Apropos of cat charming, I have a vivid recollection of once "charming" a cat to within an inch of getting myself thoroughly well thrashed. There lived in our neighbourhood a kind-hearted old gentleman who was good enough to take a fancy to my ungrateful self and would frequently invite me—he was a bachelor—to dine with him. The dining part of the business I had not the least objection to, but after dinner, when we had chatted till he fell into a doze, it became to a boy nine years old rather tedious. It was on one such occasion that I behaved so disgracefully. The old gentleman was nodding, with his slippered feet crossed easily before the fire, and a fat tortoiseshell cat, his property, lay along the rug placidly asleep too. Had I been a good boy I should have sat still and turned the leaves of "Fox's Book of Martyrs" till my friend awoke. But I was not a good boy. I felt myself like a martyr, doomed to the dreadful torture of sitting still. I felt in my pocket for a top-string I had there, and for a minute or so amused myself by bobbing the button at the end of the string on to the nose of the tortoiseshell cat, till I had roused that lazy animal to a state of extreme irritability. This sport after a while grew tame, so I shifted the string and allowed it to dangle within an inch of my host's feet. Really it was done with scarce a thought, but the result was rather astonishing. The tortoiseshell cat, who all the time kept her eye on the tormenting string, no sooner saw it at a distance convenient to spring at, made a bound, and missing the cord fiercely embraced one of the slippered

members with ten of her talons. For the moment I was too frightened to weigh the possible consequences of laughing, and laughed outright, which, with the sudden bound the old gentleman gave, so alarmed the tortoiseshell cat that she flew towards the door like a mad cat. I doubt, however, whether its utmost agility would have saved it from the tongs with which its outraged master pursued it, had I not ashamedly explained the matter and begged forgiveness.

I have at the present time about my house a cat that came into my possession under rather singular circumstances. Before we knew her we had a cat that gave perfect satisfaction, was a good mouser, and an affectionate mother. In the rear of our house there is a shed commonly used as a wood store, and frequented at least once a day. It is by no means a secluded place, and the door, through a weakness in its hinges, is constantly ajar. One morning there was discovered in the shed not only a strange she cat but a strange kitten with its eyes open, plump, and about a fortnight old. The strange cat made no attempt to stir when the maid entered, but lay suckling her baby, and looking up with an expression that said as plainly as cat language could, "a persecuted cat and her kitten, at your service; don't drive us out, that's a good creature." More singular still, before the person appealed to could consider the case, our own cat peeped into the shed, and after deliberately walking up to the refugees and giving them a kindly touch with her nose, walked back to the servant and commenced to rub against her, purring the while as though to manifest her goodwill towards the strangers, and to recommend a favourable consideration of their case. So they were taken in.

As soon, however, as the novelty of the affair wore off, it began to dawn on us that we did not require a "housefull" of cats—though for that matter the four lived happily enough together. Which should we get rid of? The strange cat's kitten was too big to drown and too little to send adrift, our own "Topsy" and her daughter must of course be retained, so there was nothing left but to send away the strange she cat. She was rather a good looking cat, and that, coupled with her known cleverness, gave us good ground for supposing that she would soon find another home. It appeared, however, that we did not give her credit for being nearly so clever as she was.

It was arranged that she should be conveyed in a basket to a certain square about a quarter of a mile distant, and there left to seek her fortune. To the best of everybody's belief this

arrangement was carried out to the letter; therefore the amazement of the entire household may be easily imagined when on reference being made to the cat-cupboard to see how Topsy and her two young charges were getting on, to find no Topsy at all,—only the strange cat and the two kittens. How the cheat had been accomplished it was impossible to say. That Topsy was not the cat placed in the basket was vouched for by two witnesses—one of whom had held the basket-lid open while the other pushed the animal in. Perhaps in my own mind I have little doubt how the business was so mulled, but I know that in certain quarters there exists a belief either that by some sort of witchery the strange cat put on so Topsical an appearance as to deceive her would-be smugglers, or that after she was basketed she managed to sneak out, and either by persuasion or force induced the unlucky Topsy to take her place.

However it came about, the result is that the strange cat alone reigns at our house to the jealous exclusion of all her species. No one, I believe, has any particular affection for her, but that circumstance is not observed to prey on her mind or to interfere with her appetite. She devours her rations with the air of a cat who is conscious that she has earned them, and as though she is aware, and rather gloried than otherwise in the knowledge that she is regarded as a cunning and manœuvering beast, who first by hypocritical representations induced an honest cat to obtain for her a situation, and who afterwards ungratefully contrived to push out her benefactress and progeny and install herself in their place.

In the form of a letter, a friend of the Rev. J. G. Wood furnishes that gentleman with some interesting particulars of two commercial cats of his acquaintance. "I must now tell you something about our Mincing Lane cats. Their home was the cellar, and their habits and surroundings, as you may imagine from the locality, were decidedly commercial. We had one cunning old black fellow whose wisdom was acquired by sad experience. In early youth he must have been very careless; he then was always getting in the way of the men and the wine cases, and frequent were the disasters he suffered through coming into collision with moving bodies. His ribs had often been fractured, and when nature repaired them she must have handed them over to the care of her 'prentice hand,' for the work was done in rather a rough and knotty manner. This battered and suffering pussy was at last assisted by a younger

hero, who, profiting by the teachings of his senior, managed to avoid the scrapes which had tortured the one who was self educated. These two cats, junior and senior, appeared to swear (cats will swear) eternal friendship at first sight An interchange of good offices was at once established. Senior taught junior to avoid men's feet and wine cases in motion, and pointed out the favourite hunting grounds, while junior offered to his mentor the aid of his activity and physical prowess.

"Senior had a cultivated and epicurean taste for mice, which he was too old to catch; he therefore entered into a solemn league and covenant with junior to the following effect. It was agreed between these two contracting powers that junior should devote his energies to catching mice for the benefit of senior, who in consideration of such feudal was to relinquish his claim to a certain daily allowance of cats' meat in favour of junior. This courteous compact was actually and seriously carried out. It was an amusing and touching spectacle to behold young pussy gravely laying at the feet of his elder the contents of his 'game bag;' on the other hand, senior, true to his bargain, licking his jaws and watching junior steadily consuming a double allowance of cats' meat.

"Senior had the rare talent of being able to carry a bottle of champagne from one end of the cellar to the other, perhaps a distance of a hundred and fifty feet. The performance was managed in this wise. You gently and lovingly approached the cat, as if you did not mean to perpetrate anything wicked; having gained its confidence by fondly stroking its back, you suddenly seized its tail, and by that member raised the animal bodily from the ground; its fore-feet sprawling in the air ready to catch hold of any object within reach. You then quickly bring the bottle of wine to the seizing point; pussy clutches the object with a kind of despairing grip. By means of the aforesaid tail you carefully carry pussy, bottle and all, from one part of the cellar to another. Pussy, however, soon became disgusted with this manœuvre, and when he saw a friend with a bottle of champagne looming, he used to beat a precipitate retreat."

The rev. gentleman before quoted had at one time in his possession a marvellously clever little cat, which he called "Pret," and concerning which he relates a host of anecdotes. From them are culled the following:—

"Pret" knew but one fear, and had but few hates. The

booming sound of thunder smote her with terror, and she most cordially hated grinding organs and singular costumes. At the sound of a thunder-clap poor Pret would fly to her mistress for succour, trembling in every limb. If the dreaded sound occurred in the night or early morning, Pret would leap on the bed and crawl under the clothes as far as the very foot. If the thunder-storm came on by day, Pret would jump on her mistress's knees, put her paws round her neck, and hide her face between them.

She disliked music of all kinds, but bore a special antipathy to barrel-organs; probably because the costume of the organ-grinder was unpleasing to her eye as his doleful sounds to her ears. But her indignation reached its highest bounds at the sight of a Greenwich pensioner accoutred in those grotesque habiliments with which the crippled defenders of their country are forced to invest their battered frames. It was the first time that so uncouth an apparition had presented itself to her eyes, and her anger seemed only equalled by her astonishment. She got on the window-sill, and there chafed and growled with a sound resembling the miniature roar of a lion. When thus excited she used to present a strange appearance, owing to a crest or ridge of hair which used to erect itself on her back and extend from the top of her head to the root of her tail, which latter member was marvellously expanded. Gentle as she was in her ordinary demeanour, Pret was a terrible cat when she saw cause, and was undaunted by size or numbers.

She had a curious habit of catching mice by the very tip of their tails, and of carrying the poor little animals about the house dangling miserably from her jaws. Apparently her object in so doing was to present her prey uninjured to her mistress, who, she evidently supposed, would enjoy a game with a mouse as well as herself; for, like human beings, she judged the character of others by her own.

This strange custom of tail-bearing was carried into the privacy of her own family, and caused rather ludicrous results. When Pret became a mother, and desired to transport her kittens from one spot to another, she followed her acquired habit of porterage, and tried to carry her kittens about by the tips of their tails. As might be supposed, they objected to this mode of conveyance, and, sticking their claws in the carpet, held firmly to the ground, mewing piteously, while their mother was tugging at their tails. It was absolutely necessary to release the kittens from their painful position, and to teach

Pret how a kitten ought to be carried. After a while, she seemed to comprehend the state of things, and ever afterwards carried her offspring by the nape of the neck.

At one time, when she was yet in her kittenhood, another kitten lived in the same house, and very much annoyed Pret by coming into the room and eating the meat that had been laid out for herself. However, Pret soon got over that difficulty by going to the plate as soon as it was placed at her accustomed spot, picking out all the large pieces of meat, and hiding them under a table. She then sat quietly and placed herself sentry over her hidden treasure, while the intruding cat entered the room, walked up to the plate, and finished the little scraps of meat that Pret had thought fit to leave. After the obnoxious individual had left the room, Pret brought her concealed treasures from their hiding-place, and quietly consumed them.

Clever as Pret was, she sometimes displayed a most unexpected simplicity of character. After the fashion of the cat tribe, she delighted in covering up the remnants of her food with any substance that seemed most convenient. She was accustomed, after taking her meals, to fetch a piece of paper and lay it over the saucer, or to put her paw in her mistress's pocket and extract her handkerchief for the same purpose. These little performances shewed some depth of reasoning in the creature, but she would sometimes act in a manner totally opposed to rational action. Paper and handkerchief failing, she has been often seen, after partly finishing her meal, to fetch one of her kittens, and to lay it over the plate for the purpose of covering up the remaining food. When kitten, paper, and handkerchief were all wanting, she did her best to scratch up the carpet, and to lay the torn fragments over the plate. She has been known, in her anxiety to find a covering for the superabundant food, to drag a table-cloth from its proper locality, and to cause a sad demolition of the superincumbent fragile ware.

A year or two since, the budget of the Imperial Printing Office in France, amongst other items, contained one for cats, which caused some merriment in the legislative chamber during its discussion. According to the "Pays" these cats are kept for the purpose of destroying the numerous rats and mice which infest the premises and cause considerable damage to the large stock of paper which is always kept there. This feline staff is fed twice a day, and a man is employed to look

after them: so that for cat's meat and the keeper's salary no little expense is annually incurred; sufficient in fact to form a special item in the national expenditure. Of these animals a somewhat interesting anecdote is related.

It appears that near to the Imperial Printing Office is situated the office of the Director of the Archives, and the gardens of the two establishments are adjacent. In that belonging to the latter gentleman, were kept a number of choice aquatic birds, for whose convenience a small artificial river had been constructed. Their owner suddenly discovered one day that his favourites were diminishing in a mysterious manner, and set a watch to ascertain the reason. Soon it was discovered who were the marauders—the cats! The enraged Director, acting in the spirit of the law, thought he had a perfect right to shoot and otherwise destroy these feline burglars whenever he found them on his grounds, and accordingly did so. Traps were set, and soon half-a-dozen cats paid the penalty of their crimes.

The keeper of the cats also, by this time, found that the muster at meal times was much scantier than usual, and reported to his superior, the Director of the Printing Office. At first, the workmen were suspected of killing them; but the appearance, one day, of a cat with a broken snare round its neck, put the keeper on a fresh scent, and ultimately led to the discovery of the truth. The Director thereupon complained to his brother official, who only replied by pointing to the thinly tenanted pond, and saying that he would not have his birds destroyed if he could help it. The result was that a fierce hostility reigned between the two establishments, until an arrangement was made by their respective heads. By this treaty it was stipulated that the Director of the Imperial Printing Office should, on his part, cause every outlet by which the cats gained access to the gardens of the Director of the Archives to be carefully closed, and every means taken to prevent such a contingency; while on the other hand, Monsieur, the Director of the Archives, agreed never to molest any cat belonging to the Imperial Printing Office, who should, by some unforeseen accident, obtain admittance into his garden. And thus, by this famous treaty, the horrors of civil war were averted!

A curious instance of the attachment of animals totally dissimilar in habits, is related in the *Leisure Hour* as follows:—

"A lady of the writer's acquaintance was once walking amid the scenery of the Isle of Wight, when she observed a

little kitten curled up on a mossy bank in all the security of a mid-day nap. It was a beautiful little creature, and the lady gently approached in order to stroke it, when suddenly down swooped an hawk, pounced upon the sleeping kitten, and completely hid it from her sight. It was a kestrel. Our friend was greatly shocked, and tried to rescue the little victim; but the kestrel stood at bay and refused to move. There he stood on the bank, firmly facing her; and all her efforts to drive him from his prey failed. The lady hurried on to a fisherman's cottage, which was near at hand, and told of the little tragedy with the eloquence of real feeling. But the fisher-folk were not so disconcerted, and, laughingly, said,—'It is always so; that hawk always comes down if anybody goes near the kitten. He has taken to the kitten, and he stays near at hand to watch whenever it goes to sleep.'

"The case was so remarkable, that the lady inquired further into its history, and learned that the kitten's mother had died, and that the fisherman's family had suddenly missed the little nurseling. After some time they observed a kestrel hawk loitering about the cottage. They used to throw him scraps of meat, and they observed that he always carried off a portion of every meal, dragging even heavy bones away out of sight. His movements were watched, and they saw that he carried the stores to the roof of his cottage. A ladder was placed, some one ascended, and there, nestling in a hole in the thatch, lay the lost kitten, thriving prosperously under the tender care of its strange foster-father. The foundling was brought down and restored to civilized life; but the bandit protector was not disposed to resign his charge, and ever kept at hand to fly to the rescue, whenever dangerous ladies threatened it with a caress."

That a long course of domestic drill is insufficient to win a cat from its native savagery is proved by the following scrap, lately culled from the *Swansea Herald*:—

"A fight of more than ordinary interest took place on the bank of the canal near Kidwelly Quay, a few days ago. A domestic cat, making her usual walk in search of prey along the embankment, was attacked by an otter of no small dimensions, and was in an instant tossed into the middle of the canal, and there had to fight, not for the 'belt,' but for her life, in an uncongenial element. But very soon they were observed by some sailors and shippers, employed not far from the scene of contest, who hastened to witness the strange occur-

success. Either from fear of the men, or of its formidable antagonist, the otter relinquished its hold, and poor puss safely landed amidst hearty cheers and congratulations. But puss, not being content with the laurels she had won in the first contest, went out again on the following day, and, strange to say, the old combatants met again, and the otter, with undiminished pluck, attacked the cat on land. The contest became very severe, but ultimately the otter was glad to regain its watery refuge, and leave puss the victor the second time, without suffering very considerably from an encounter with such a formidable foe."

Next comes the story of a traveller-cat, derived, like the preceding, from a newspaper source:—

"In a parish in Norfolk, not six miles from the town of Bungay, lived a clergyman who, having a cat, sentenced it to transportation for life, because it had committed certain depredations on his larder. But the worthy gentleman found it far easier to pronounce that sentence than to carry it into execution. Poor puss was first taken to Bungay, but had hardly got there when she escaped, and was soon at home again." Her morals, however, had in no way improved, and a felonious abstraction of butcher's meat immediately occurred. "This time her master determined to send the hardened culprit away a distance, which, as he expressed it, 'she would not walk in a hurry.' He, accordingly, gave her (generous man!) to a person living at Fakenham, distant at least forty miles. The man called for her in the morning, and carried her off in a bag, that she might not know by what road he went. Vain hope! She knew well enough the way home, as he found to his cost, when, directly the house-door was opened the next morning, she rushed out, and he saw no more of her.

"The night after, a faint mewing was heard outside the minister's dwelling, but, not being so rare an occurrence, no attention was paid to it. However, on opening the door next morning, there lay the very cat which he thought was forty miles away, her feet all cut and blistered, from the hardness of the road, and her silky fur all clotted and matted together with dust and dirt. She had her reward. However her thievish propensities might annoy him, the worthy vicar resolved never again to send her away from the house she loved so well and exerted herself so nobly to regain."

There is a capital story told of a monastery-cat, which,

albeit an old one, will very well bear telling again. Perhaps, indeed, the secret of its freshness lies in the seasoning—like many another dish.

The legend runs thus:—In a certain monastery, in which a cat was kept, the cook, one day, on laying the dinner, found one of the holy inmate's portions of meat missing, although he thought he had cooked the proper quantity; still the good man was willing to believe he had miscalculated, and, without making any ado about it, supplied the deficient dinner. Next day, however, the same thing happened again—another monk's meat was gone. The cook began now to suspect treachery, and resolved to watch. On the third day he took particular care in apportioning the dinners, which were cooked, and about to be served up, when he heard a ring of the gate-bell, and hastened out to answer it. On his return, he discovered one of the dinners was gone; but how, or by whom, it was taken he could not imagine. He determined to discover the thief, and next day took the utmost precaution in seeing that the number of dinners was quite correct. When all was ready to dish up, the bell rang again. This time, however, he did not go to the gate, but only just outside the kitchen, and, peeping through the door, he saw the cat jump through the window and, seizing a piece of the meat, make his exit from the same way as rapidly as he entered. So far the mystery was solved; but who rang the bell? The next day the vigilant cook found that this part of the performance was also played by the ingenious *felis domesticus*, whose *modus operandi* was first to jump at the bell-rope and pull it with its paw, then, watching the cook out of the kitchen, to swiftly spring through the window, seize the meat, and then, as swiftly, out again.

The cook told the story of the feline thief to the monks, and those holy brethren, in full conclave assembled, after hearing the evidence, came to the resolution that the cat should enjoy uninterrupted the fruits of its predatory art so long as it chose to practise it; and that the wondrous tale should be published abroad. The result of this decision was that for a considerable time visitors continually poured to the monastery, and were, for a small fee, admitted to witness the excellent comedy, which paid for the extra rations of the cat, and put a little money into the pockets of the monks as well.

It is a curious fact that in countries liable to earthquakes the cat is able to predict the coming event; and a very singular

instance of this occurred at the great earthquake at Messina. A short time before that awful catastrophe, a merchant living in the town noticed that in the room in which he was sitting his two cats were running about and scratching at the floor and doors in a very excited manner. He opened the door and let them out; but they only scampered off to the next door, and there began scratching again in the same way. He was convinced that they wanted to get fairly out of the house; so the owner opened the other doors leading to the street, at all of which, while he was unfastening them, they exhibited the utmost impatience. Struck with their uneasiness, he determined to follow them and endeavour to find the cause of it. Once out in the street, they rushed off in a frantic state through the town, out of the gates, and never stopped till they were some distance out in the country. The merchant, who had followed them quietly, at last found them in a field, still very excited and scratching at the ground with their feet. In a few minutes the first shock of the earthquake came, which buried, in its hungry jaws, many of the houses in the town, that belonging to the merchant amongst the number.

DISEASES OF CATS AND THEIR CURE.

To cure a cat of her ailments it is in most cases necessary to administer physic in some shape or another. This at the very outset is enough to daunt at least nine-tenths of the lady cat-owners in the kingdom. "As difficult as giving pills to a sick cat," is a familiar way of illustrating the extreme hardship of any task, and yet when properly managed a sick cat may be made to take pills or any other drug without risk of a severe scratching on your part, and danger of a dislocated neck on the part of suffering Grimalkin.

If the cat and yourself are on good terms, you will experience no difficulty in approaching her, whatever be her bodily condition. Have ready a large cloth—a crumb cloth for instance—and wrap the patient therein, wisping the cloth round and round her body so that every part of her except the head is well enveloped. Any one may then hold it between their knees while you complete the operation. Put on a pair of stout gloves, and then with a firm hand open the animal's mouth wide. Do not attempt to pour down the cat's throat too much at a time, or your object will be frustrated. A small spoon should be used, and no more poured into the mouth at a time than may be easily swallowed.

Be very careful to cleanse the fur of the animal's face and neck of any physic that may have been smeared thereon. The cat of all things dislikes a dirty coat, and as the nastiness of the medicine will prevent her licking herself clean she will go about in a miserable condition, and one that will probably counteract the good effects of your doctoring. After the dose has been swallowed you may unswathe the patient and turn her into a quiet room, where there is something soft for her to lie on, and a cheerful fire. Do not offer her any food for at least two hours after the administration of the physic.

Diarrhœa is a very common complaint with cats. It may be known by the animal's becoming thin, by her coat being dirty, and by her dull eyes. Unless this be checked, dysentery will set in, and the cat's life be sacrificed. An ounce of fresh mutton suet, dissolved in a quarter of a pint of new milk, will, if the malady be taken in hand in its earlier stage, effect a speedy cure. The milk should only be warm enough to melt the shredded suet; and if it be too ill to lap, put one or two spoonsful into its mouth every two hours. If the scouring do not abate, a spoonful of chalk mixture, with eight drops of tincture of rhubarb, had better be given.

Cats are sometimes attacked by fits of delirium. The animal may be discovered with staring eyes and bristling fur, rushing here and there in a way most terrible to see. Generally it finishes by plunging into the darkest corner it can find,—into a lumber-room or the coal-cellar may be,—and will there remain to die unless attended to. There are several remedies for this disorder, but that advised by Lady Cust is certainly the most efficacious. "Take a sharp pair of scissors and slightly slit one of the ears, but not to disfigure the cat; it must be in the thin part of the ear. Have ready some warm water, and hold the ear in it, gently rubbing it and encouraging the blood to flow; a few drops give relief. The most timid lady need not fear to perform this slight operation, as during the attack the animal does not feel, nor does it resist in any way; but I always use thick gloves in handling animals myself, and I recommend them to others. When the attack is over, keep the cat quiet, as you will observe it is very nervous after, and alarmed with the slightest sound; and let its food be rather less in quantity, and less nutritious in quality, till it is past the time of fits."

The lady above quoted makes some interesting remarks on the subject of grass eaten by cats. "Cats will never prosper

without grass to eat! I have long observed and been convinced of this; and was ridiculed for my opinion when I asserted it, even by some learned members of the Zoological Society, who would not believe that grass was necessary to the feline tribe in general, or that they would even eat it, until they witnessed the voracity with which it was devoured after a deprivation of it for a few days. I am perfectly certain it is essential for the maintenance of health and life in that species. In the first place it cools the blood, preventing humours, and contributes to the healthy condition of the skin, rendering the fur fine and glossy. It has also a material effect on the general health. Every one must have observed the constant licking bestowed on the coat, and the rough nature of the tongue. Consequently, the loose hair is conveyed to the stomach and intestines, where it remains in balls or long rolls, causing dulness and loss of appetite, and ending in death. The hair swallowed adheres to the rough grass and is then digested, *or* if the mass is too large (as is often the case in the moulting season, especially with Angora cats), it will be seen thrown up: long rolls of hair with grass, perfectly exclusive of any other substance; and the animal that a few minutes previous was dying, will now be relieved, and take its food as usual."

In the spring and autumn cats are frequently afflicted with a disease resembling chicken-pox in the human subject. The head and throat are the parts chiefly attacked, the hair falls off, and the animal's appearance is very miserable. Rub the places with flour of brimstone mixed with hogs' lard.

When the cat has kittens never be so hard-hearted as to carry off at one sweep the whole of her little family. There is no animal on earth that exhibits more affection for its progeny than the cat. It will go hungry that its young ones may eat, and will face the most terrible dangers in their behalf. If her children are taken from her, she goes for days stalking about, a lean and wretched cat, filling the house with her melancholy mewings. Therefore be merciful. If the entire litter *must* be destroyed take them away one at a time, allowing a day or two between. Motherless kittens may be reared by hand by sweetening new milk with brown sugar and feeding them with the mixture several times a day. The best substitute for the healthful licking afforded by the mother's tongue is a soapy sponge squeezed nearly dry.

"Cats," writes Lady Cust, "have a very dangerous com-

plaint, which I call distemper, though it is different to the distemper in dogs. I do not think it occurs more than once; and it is well it does not, as it requires every care and attention to save the life of the sufferer. Sometimes it begins with constant vomiting of a bright yellow frothy liquid, diarrhœa then comes on, which ends in dysentery. If you see the yellow vomiting, give the small dose of salt and water before named; in this case it will act as an emetic. When the stomach is cleared, then, as the vomiting will continue from irritation, and reduce the strength to the last degree, very painful to witness, stop it as soon as you can, by giving half a teaspoonful of melted beef marrow, free from skin. One dose is generally sufficient; but if it is not, another half-spoonful may be given in half an hour. To allay vomiting from irritation, I have never seen this simple remedy fail in either the human or animal subject. I have tried it upon all species of carnivora with equal success: the former should take it upon toast, with salt without pepper, overcoming the great repugnance it causes in sickness."

THE SQUIRREL.

THIS pretty home pet, which is found generally throughout Europe and Northern Asia, is well represented by this handsome, active, little fellow, whose home is among the branches of British park and forest trees.

It is true that this prime favourite, especially with boys and girls, comes to our homes unprovided with any special recommendation, either on the score of utility or usefulness. It cannot guard the house like the dog, or catch mice like the cat, or wage war against black-beetles and cockroaches like that prickly pet the hedge-hog. I am not sure, however, that this incapacity to *earn* our regards is against his chances of remaining a pet as long as any creature treated of in this volume. By *earning* I mean to acquire a right,—to furnish an equivalent for goods required, and on such terms as make it downright dishonesty to fail to furnish the goods; which in the case of the beetle-catcher, and the canine watchman, and the expeller of mice, means food and drink and lodging. It might be argued by a sour philosopher that to retain the animals above mentioned and many others in this book enumerated—the egg-producing hen, the pie-affording pigeon, the Michaelmas feast-supplying goose—is no more pet-

keeping and the animals specified no more *pets* than are Mary Jane the all-work maid, or John the gardener; and that while the keepers of these producing and working animals flatter themselves that they are good-natured patrons of this hobby or of that, they are in reality but hucksters and petty chapmen in disguise. As the reader knows, I am altogether opposed to this coarse and untrue doctrine. What I am inclined to believe is this, that a creature, to be absolutely and purely a pet, is it that has nothing but affection and gratitude to offer in return for any kindness vouchsafed. Nothing is so pitiful as complete helplessness, and nothing so closely allied to pity as love. Take the case of our baby—of your baby—of everybody's baby;—I doubt if it would be half so precious if it could demand its titty, and threaten to walk off and be somebody else's baby if it was not instantly supplied. At the same time, however, be it understood that neither for the squirrel's sake, nor the sour philosopher's sake, do I mean to retract the title of pet, as applied to every creature treated of in this book, and perhaps this entire rigmarole might better have been compressed into these few words:—that pet-love, like every other, has its degrees, and that that assigned to the squirrel is, for reasons already mentioned, of rather a high order.

The following are the squirrel's chief characteristics. Its English name is a corruption of the scientific appellation *sciurus*, from *skia* a shade, and *oura* a tail, and no doubt alludes to the animal's habit of shading its entire body with its tail when it is in a state of rest. Its common length from the nose to the tip of the tail is about fifteen inches; the ears are terminated by long tufts of hair; the colour of the head, body, tail, and legs is a bright reddish-brown; the belly and breast are white; the eyes large, black, and sparkling; the fore-feet strong, sharp, and well adapted to hold its food; the legs short and muscular; the toes long, and the nails sharp and strong; the upper lip is cleft; the fur short and silky; there are four molar teeth on each side of the lower jaw, and five in the upper. In each jaw there are two incisors.

They seem—at least the English squirrel—to prefer the fir-tree to all others as a site for their nest. In forming the nest they begin by gathering mouthfuls of dry, heathy grass in the way we see rabbits do, and of this grass they make a considerable deposit. The outside is afterwards protected with a number of sticks, giving the nest the appearance of a bird's nest. When the young are ready to be deposited, the female

squirrel scratches off her fur in the manner of the rabbit, so that its stomach is sometimes quite bare. This providential arrangement, however, answers a two-fold purpose. While the nest is thus rendered warm and snug for the little squirrels, a space round the mother's teats is cleared of the thick fur, enabling the little ones to suck without difficulty. The number of young produced at a litter varies from three to five. They are usually born in the middle of summer, and cut a very odd appearance, on account of the extreme shortness of their tails. Indeed, they scarcely attain full growth of this caudal appendage till the following spring, when they leave the paternal roof and commence business on their own account.

When free among its native boughs, its apparent recklessness is certainly enough to startle the observer unacquainted with squirrel nature. Without the least hesitation it will launch itself into the air though there may not be a branch on which it can alight for full twenty feet below; but, buoyant, almost, as a bird, it alights on the branch, and, staying but an instant, it makes another leap more tremendous than the last. It rather seems to *sink* through the air as does a weight in water than to fall, and there can be no doubt that the expanded tail and spread feet opposing the air tends to this effect.

It may be easily imagined that a creature whose playground is the top twigs of tall trees, where no human climber dare venture, is by no means easy to capture—especially as its hearing is keen, and its vision remarkably acute. Still, among boys living in the vicinity of large woods and copses, squirrel-hunting is a favourite diversion, and none the less so because it is seldom attended by success. "The only plan," says the Rev. Mr. Wood, "is to watch the animal until it has ascended an isolated tree, or, by a well-directed shower of missiles, to drive it into such a place of refuge, and then to form a ring round the tree so as to intercept the squirrel, should it try to escape by leaping to the ground and running to another tree. The best climber is then sent in chase of the squirrel, and endeavours, by violently shaking the branches, to force the little animal to loose its hold and fall to the earth. But it is by no means an easy matter to shake a squirrel from a branch, especially as the little creature takes refuge on the topmost and most slender boughs, which even bend under the weight of its own small body, and can in no way be trusted with the weight of a human being. By dint, however, of perseverance, the squirrel is at last dislodged, and comes to the ground as lightly as a

snow-flake. Hats, caps, sticks, and all available missiles are immediately flung at the luckless animal as soon as it touches the ground, and it is very probably struck and overwhelmed by a cap. The successful hurler flings himself upon the cap, and tries to seize the squirrel as it lies under his property. All his companions gather round him, and great is the disappointment to find the cap empty and to see the squirrel triumphantly scampering up some tree where it would be useless to follow it."

The squirrel is a hibernating animal, and providently anticipates the dearth of winter by accumulating a store of nuts and acorns. About the first week in October is the time when the squirrel may be seen in the oak and the nut trees, as busy as a "pole-puller" in a Kentish hop-garden. With a critical eye he examines a bunch of nuts, picking out the brownest and the ripest, and never, by any chance, is he guilty of the indiscretion of taking home a nut into which, or, rather, out of which, a maggot has bored. He seems, too, to be aware of that excellent maxim,—"never trust all your eggs in one basket." He well knows that if all his hoard were trusted in one magazine, and that magazine should be discovered and plundered, there is nothing left but starvation; so he deposits his collection in ten or a dozen different holes and crevices, and such is his wonderful power of memory, that though the snow may fall and cover, to the depth of a foot, the place where his nuts are, he knows their whereabouts to an inch, and scratches straight down to them with a confidence that is invariably rewarded with success.

That is, unless burglary has been perpetrated, which not unfrequently happens. A gentleman residing in Hampshire informed me that at the close of one autumn he lit on a squirrel busy at the stump of a tree, and on closely inspecting the spot discovered in a hole in the bark as many nuts as would fill a gill measure. He took no further notice at the time, but passing the same spot the following week he had another peep at the savings-bank, and found that there had been several fresh deposits. He took out the whole of the treasure and filled up the hole with pebbles. He thought no more about the matter till the following January, when he chanced once more to come near the same spot. It was a very hard winter, and the snow lay at least ten inches deep; he had no difficulty, however, in finding the industrious little squirrel's store-room, for it was evident it had paid it a visit but a very little time before. The snow was brushed clean from about it, and every

one of the pebbles was turned out of the hole on to the hard earth. "I never," said the gentleman in question, "felt the folly of practical joking so fully in all my life. Fancy the poor little fellow nipped up with cold and scanty food, but, foreseeing a long winter, resolved to economize his little hoard as well as possible; fancy him at last determined to break this—perhaps his last—magazine, and cheerily brushing away the snow, fully confident that a good meal awaited him as the reward of his cold job, and, after all, finding nothing but stones! I never felt more mean and ashamed in all my life, and really would have given a guinea to have known that injured squirrel's address. He should have had as fine a lot of nuts as would have put him beyond the reach of poverty, had he lived to be as old as Methuselah."

The manner in which the squirrel takes its food is as pretty as it is curious. It does not grub at its food with its head to the ground like an ordinary quadruped, but takes it as if it had a nut or an acorn between its fore paws as it squats on its hind ones, and with its sharp chisel-like teeth cuts off the top of the nut. The rest of the shell is soon demolished; and then, retaining the kernel in its paws, turns it about rapidly, and divests it of every particle of husk; it then leisurely and complacently nibbles at it till it is devoured.

It exhibits great affection for its young. Mr. Jesse relates, that in cutting down some trees on an estate at Petersham, the axe was applied to the root of a tall tree, on the top of which was a squirrel's nest, and a rope was fastened to the tree for the purpose of bringing it down more expeditiously. The workmen cut at the roots; the rope was pulled; the tree swayed backwards and forwards, and at last fell. During all these operations the female squirrel never attempted to desert her new-born young, but remained with them in the nest. When the tree fell down she was thrown out of the nest, and was secured unhurt and put in a cage with her young ones. She suckled them for a short time, but refused to eat. Her maternal affection, however, remained till the last moment of her life, and she died in the act of affording all the nourishment in her power to her offspring.

As regards the purchase of a squirrel, considerable care is necessary, or the purchaser will be most lamentably taken in. Many are sold by the dealers in dogs and birds, but the greater part by men in smockfrocks, who go about the streets with a squirrel or two to sell, and who assert that they have caught

and tamed them themselves. As to who caught them is, of course, no business of yours; your object is to purchase a *tame* squirrel, and, goodness knows, those that the countryman is desirous of selling are tame enough. They allow their limbs to be pulled about, their tails to be stroked and twisted all sorts of ways, and will lie extended, as though dead, along the countryman's arm at word of command. Still, it is just about five chances to one that the squirrel is really as savage as ever it was in its life, but rendered intoxicated and incapable by the use of *strychnine*. One of two things will certainly be the result,—either the squirrel will within a few hours of its reception into the bosom of your family recover from the pernicious dose, and, assuming its proper character, scamper off through a door or window, or else it will die. Whether, as in the hedgehog's case, as tested by Dr. Ball, the squirrel would yield its wild nature to a single attack of whisky or any other spirituous thief that, put into the mouth, "steals away the brains," has not, to my knowledge, ever been tested.

The time to buy a squirrel is about the end of September, for then the animal, if newly caught, will be fat, healthy, and vigorous, and its fur in its prime. Never mind about the creature's tameness; if you wish to cultivate its friendship it will be better to tame it yourself. The key to the squirrel's heart is of the same old pattern, and is called by the same old name as the key to every difficulty, little or big, that the world may present—patient kindness. House him in a cage in which is comprised a great revolving cylinder of zinc wire, and to which is attached a snug little ante-room, to which he may retire when he feels so disposed. Squirrel-cages being pretty much of one pattern, and that pattern being seemingly well adapted to their habits, nothing further need be said on that head, except it be—have your cage *large* enough.

As to the squirrel's food, you must be guided by his habits while in a state of freedom. He will enjoy any sort of small nuts (it will be as well to avoid those of a very oily nature) or some grains of wheat, or an acorn; a stale crust of bread will be taken between his little hands with a deal of pleasure, and as a treat a bit of boiled potato, and even a bit—a little bit, of course—of fresh meat will do him no harm. This will not be outraging the squirrel's nature, as in a wild state he frequently asserts his claim to be classed with the carnivora by robbing birds' nests, and carrying off members of the young brood.

In selecting a squirrel, see that his fur is sleek and glossy, his

feet "clean," his eyes bright, and his teeth *white:* this latter particularly. For if a squirrel's teeth be yellow, be sure that he is an old animal, used to liberty for many years, and, consequently, all the harder to break in.

Besides the squirrel with which we are familiar, there are so many others of the species, that to give any other than a cursory notice of the most curious would be quite impracticable in a volume like the present. There is the palm squirrel, a little fellow of yellow colour, barred with black bars, found in Africa, and which lives among the cocoa-trees, and is wonderfully fond of *Sury*, or palm wine, which, among other good things, is yielded by the cocoa-tree. Then there is the squirrel that haunts the plains (not the trees) in the neighbourhood of Lake Winipeg, in America, and which the Cree Indians call Savoacka-Wappiocoos; and the four-banded pouched squirrel, which, as its name implies, has a pouch on either side of its jaws; and the Great Malabar squirrel, measuring, from the nose to the tip of its tail, nearly a yard, and richly tinted with chocolate and chestnut and black. This species, like the palm squirrel, builds its nest in the cocoa-tree, and, biting through the tough husk with its sharp teeth, drinks the cocoa-milk and eats the cocoa-flesh, and, altogether, seems to live a very jolly life indeed.

The Chipping squirrel, or Hackee, as it is sometimes called, is one of the prettiest of the species. It is but eleven inches in length, of which the tail occupies four inches. Its colours are brownish-grey on the neck, glowing into orange-brown on the forehead and the hinder quarters. Along its back and sides extend five black and two cream-coloured stripes, and the throat and under parts are snowy-white. It may be easily seen, from this description, that the Hackee is rather a nice-looking little animal. It is a native of North America.

It is a burrowing animal, but would seem to be no more easy of capture than those of arboreal habits. Audubon gives a description of a Hackee hunt:—"This species is, to a certain extent, gregarious in its habit. We had in autumn marked one of its burrows, which we conceived well adapted to our purpose, which was to dig it out. It was in the woods, in a sandy piece of ground, and the earth was strewed with leaves to the depth of eight inches, which, we believed, would prevent the frost penetrating to any considerable depth. We had the place opened in January, when the ground was covered with snow about five inches deep. The entrance of the burrow had

been closed from within. We followed the course of the small winding gallery with considerable difficulty. The hole descended at first almost perpendicularly for about three feet; it then continued, with one or two windings, rising a little nearer to the surface, until it had advanced to about eight feet, when we came to a large nest made of oak leaves and dried grasses. Here lay snugly covered three Chipping squirrels. Another was subsequently dug from one of the small lateral galleries, to which it had evidently retreated to avoid us. They were not dormant, and seemed ready to bite when taken in the hand; but they were not very active, and appeared somewhat sluggish and benumbed, which, we conjectured, was owing to their being exposed to sudden cold from our having opened their burrow. There was about a gill of wheat and buck-wheat in the nest; but in the galleries, which we afterwards dug out, we found about a quart of hazel-nuts, nearly a peck of acorns, some grains of Indian corn, about two quarts of buck-wheat, and a very small quantity of grass seeds."

In Java is found another of this tribe, known as the Plantain squirrel. Among the Javanese, this little animal is as commonly domesticated as is the cat among ourselves. Mr. Adams, the naturalist, says of a Plantain squirrel kept by him, that it was an amusing little animal, full of frolic and playful as a kitten. He never carried his tail over his back, like the greater number of his family, but would trail it gracefully along the ground. When angry, he would dilate this ornamental appendage and bristle up the hairs like an irritated cat. His natural cry was a weak chirping sound; but, when teased beyond his powers of endurance, he would make a sharp, low, and passionate noise. He seemed to court caresses, and would receive them with pleasure. His food consisted of bananas and cocoa-nuts, which he usually would nibble like a rat, though sometimes he would place it between his paws. He was a remarkably cleanly little creature, and was continually dressing his fur. When he slept, he rolled himself up like the dormouse, with his tail encircling his body. Always active and blithe, he would sometimes perform feats of extraordinary agility, bounding to great distances and clinging to every object within his reach.

The smallest of the squirrel tribe is one discovered by M. Chaillu in Equatorial Africa. This is called by the natives *Kendo*. Chaillu, in his wonderful gorilla book, gives an account of shooting this animal, and likewise its portrait, which, he says, "is its actual size, and taken from my stuffed speci-

men." According to this, the Kendo measures, from tail-stump to nose-tip, two inches and five-eighths.

Besides burrowing squirrels, and squirrels which live entirely in trees, there are squirrels which fly. To this family belongs the Rocky-mountain squirrel, which, bat-like, lurks in the gloom of the pine forests during the day, and rouses to activity with the night. In an account of this species, Mr. Bennet says: "They are principally distinguished from the common squirrel by what is usually termed their flying membrane. This apparatus consists of a folding of the skin along either side, so as to form broad lateral expansions, supported anteriorly and posteriorly by the limbs, between which they are extended, and by peculiar bony processes, arising from the feet. These expansions are not naked and membranous, like those of the bats, but are actual continuations of the skin, clothed externally by a dense fur, similar to that which invests every other part of the body; neither do they serve, like the flying membranes of many of the bats, the purposes of wings, their functions being limited to that of a parachute, giving to the animal a considerable degree of buoyancy, and thus enabling it to take leaps of almost incredible extent, and with the velocity of an arrow."

Flying squirrels are found in Ceylon. Sir Emerson Tennent mentions two: one peculiar to Ceylon, and the other common to Ceylon and India. He speaks of the former, which is the larger, as being assisted in its prodigious leaps from tree to tree by the parachute formed by the skin of the flanks, which, on the extension of the limbs, front and rear, is laterally expanded from foot to foot. Thus, buoyed up in its descent, the spring which it is enabled to make from one lofty tree to another resembles the flight of a bird rather than the bound of a quadruped.

THE MOUSE.

"WHAT next? Pray, Sir, have you not this time made a slight mistake and substituted a *pest* for a *pet;* or are we to have in due course instructions how to make the black-beetle happy, how the domestic spider may be fattened and fondled, and the cockroach rendered comfortable?"

My mind's ear is conscious of these and many other sarcastic queries from indignant lady-housekeepers, accompanied by a chorus of ten thousand little screams from ten thousand other ladies, old and young, who, though unafflicted by larder cares, are thrown into as complete a state of panic at the mere whisper of *mouse!* as men display at the dread mention of "mad dog." Nevertheless are we no way daunted, for replying to the taunts, and the sarcasm, and the little screams, there comes a burst of admiration for the bright-eyed, nimble little mouse, in all its varieties of brown, and mottled, and tawny, and white,—a very Babel of pleadings for it as an amusing and instructive creature, and imploring that it may not be banished from the circle of Home Pets. True the voices raised in favour of the mouse are, as a rule, little voices, whose owners, having no care as to the purchase of the next cheese or box of candles, care nothing as to how the

last was consumed, and are seldom affected beyond risibility when cook exhibits to indignant mamma the mutilated stilton, or the loaf tunnelled as neatly as though the tiny operators had studied under Sir Isambard Brunel. Never mind. The careless rogues (the boys, not the mice) will know better some day. Meantime they retain the mouse cage and triumph. Neither are they without a tolerably sound argument in favour of mouse-keeping. "What satisfaction is it," say they, "to catch a mouse and kill him? That you inflict no punishment on him is certain, as the instant a mouse is a dead mouse there is, as far as he is concerned, no more a blank in mouse-dom than though he had never lived at all. It must be a more sensible thing to get what you can out of them as some return for what they filch. What can they be made to render? Nothing but amusement. Very well; a very good thing too: and let us exact of them as much of that commodity as possible."

There is really no telling the extent of the amusement and instruction that may be gathered from close observation of the habits and peculiarities of the common little brown mouse. They have been known to emit musical sounds. I myself can bear witness to this, having heard distinctly, and for as long a time as seemed a minute, a low and continuous strain of mouse music. It was in the middle of the night, and in my bed-room. I was lying awake, when, preceded by a scratching of little paws on the fender, the soft music began. My wife heard it as well as myself. Once we whispered concerning it, but it was not disturbed, but at a second whisper there was an unmusical squeak and a scamper, and the music was at an end.

I find in an edition of the Rev. J. G. Wood's "Natural History" a letter from a clergyman friend of his—the Rev. R. L. Bampfield, of Little Barfield, Essex—giving an account of a singing mouse, or of singing mice, and which in one particular coincides with my experience.

"In a former residence of mine," says he, "some mice took up their abode behind the wainscot in the kitchen. From motives which few housekeepers would appreciate we allowed them to remain undisturbed: and most merry, cheerful little creatures they were. It seemed to us that a young brood was being carefully educated, but they did not learn all their accomplishments from their parents. In the kitchen hung a good singing canary, and by degrees the chirp of the mice changed into an exact imitation of the canary's song; at least, it was so with

one, for though several attempted it, one considerably excelled the rest. I am not sure that admiration of the music influenced them, for, from the funny facetious way in which it was done, I should rather say it was out of mockery, or at least from a love of imitation. Yet the result was very pleasing; far inferior to the canary's note in volume, strength, and sweetness, it was perhaps superior to it in softness and delicacy. Often have I listened to it with pleasure in the evening when the canary was asleep, with its head beneath its wing; and more than once have I observed a kitchen guest glance at the canary, then look round in some astonishment and say, 'Is that a bird, sir, singing?' One trustworthy person assured me that he too had in his house a singing mouse. I have therefore little doubt that if a young family of mice were brought up from the first close to a canary, or some other songster, some of them would learn to sing."

In the case above quoted the mouse's tutor was a canary: as regards the case mentioned by myself there had been for several months before the occurrence of the harmony in the fender, two able-bodied goldfinches in a room below, in full song. I may as well mention that we set a trap for our musical mouse, and that we made a capture; whether it was the right mouse and that the consciousness of being a prisoner put its tiny pipes out, or whether it was just an ordinary mouse, we had no means of ascertaining, as in spite of the most luxurious feeding it never emitted anything more musical than a squeak. The only fact in favour of the supposition that it was the musician we had caught is, that we heard it no more.

Is it possible, then, to teach a mouse to sing, or at least to utter notes, which, though inferior to those of the canary in volume, are superior to them in softness and delicacy? It would at least be worth the trouble of testing. A mouse about to litter might be kept constantly in the same chamber with a song bird, with little or no extra trouble; even if it cost a little pains, surely so great a marvel as a singing quadruped would amply repay it.

Before anything more, however, is said of the mouse's abilities, and the best mode of cultivating and realizing them, a short chat about mice generally, with their various habits and peculiarities, may not be out of place.

THE DORMOUSE.

This little animal is placed by Mr. Bell and some other

naturalists with the squirrel, which animal it closely resembles in its mode of feeding and in other ways; the arrangement of its teeth, however, is more mouse than squirrel-like.

The common dormouse is of about the same size as the common domestic species, but it is of plumper form, and its nose blunter. Its eyes are black and full; its ears round and semi-transparent; its tail two inches and a half long, and more hairy at the tip than at any other part. Its upper parts are reddish-brown, as is its belly, while its throat is white. Its fur is remarkably fine and soft.

The habits of the dormouse are well described by the author of "British Quadrupeds." "It takes its food holding it in its hands and sitting on its haunches (as do the rats), and often suspending itself by its hind feet, in which position it feeds as easily and comfortably as in the ordinary position. Towards the winter it becomes exceedingly fat, and having laid up a store of food, retires to its little nest, and, coiling itself up into a ball with the tail over the head and back, becomes completely torpid. A mild day calls it into transient life; it then takes a fresh supply of food and relapses into its former slumber; and finally awakening in the spring, at which time it has lost much of its fat, it enters upon its usual habits, and the enjoyment of the conjugal and paternal affections. The young, which generally are about four in number, are born blind, but in a few days their eyes are opened, and in a short time they are able to seek their food independently of the parents' care." The same author states that he has reason to believe that, in some cases at least, the dormouse has a second brood early in the autumn, and grounds his belief on the fact that he saw in the month of September an adult one about half grown, evidently of the spring brood, and three very young ones, apparently not more than a fortnight or three weeks old.

The nest of the dormouse is generally built in the hollows of trees near the root, or in the thickness of a low-growing bush. The materials used in the construction of its dwelling are moss, dead leaves, &c. It is by no means easy to catch a wide-awake dormouse; it hops from this branch to that, and worms itself so swiftly and unexpectedly through seemingly impossible clefts and crevices, that its capture by hand is a circumstance of rare occurrence. When, however, it composes itself for its winter nap it offers but little opposition to being made prisoner. In the third volume of the "Naturalist" there are several instances of this character quoted, and among

them one of a dormouse having been taken in its nest in the middle of December; the heat of its captor's hand and the warmth of the room completely revived it, and it nimbly scaled the furniture, finding no difficulty in ascending and descending its polished surfaces, and leaping from chair to chair with great agility. On being set at liberty, it sprang at least two yards to a table. It did not seem alarmed at being taken in the hand. In the evening it was placed with its nest in a box, and the next morning had relapsed into torpidity.

Another account in the same volume informs us that a dormouse which had been sent a distance of 140 miles seemed but little disturbed by the ride. "From that time till the month of April it slept in its snug dormitory, a deal box lined with wool, when it awoke and readily ate of apples and nuts. It is easily alarmed, being more timid than tame, but shows no sign of anger on being taken in the hand. As it sleeps the greater part of the day, I cannot then closely watch its habits; but in the evening it wakes up and is very lively and frolicsome, running, on being let out of its cage, up the bell-rope, where it will sit for hours in the fold of the knot timidly watching our movements."

The dormouse is found not only in England, but throughout the whole of Southern Europe.

Besides the common dormouse, there are the fat dormouse and the garden dormouse. The latter is somewhat larger than the common mouse, and closely resembles the common dormouse in its habits, though with less activity. It hybernates like the last-mentioned animal, but, curiously enough, grows fat instead of thin during its protracted slumbers. It is, however, hard to pin one's faith to the ancient belief that the dormouse *grows fat on sleep*, and that if its hybernation were by any accident extraordinarily protracted, it would die of sheer obesity; it is more probable that it is more easily roused to life than others of its brethren, and that each time it wakes it makes a substantial meal and then tucks itself comfortably to sleep again. This being the case, its inordinate fatness ceases to be a wonder.

The fat dormouse was highly esteemed by the ancient Romans as a table delicacy; there were established *gliaria*, or places where dormice were bred and fattened for the table. The fur of the fat dormouse is long and soft; ash-coloured above, and dingy white beneath.

The garden dormouse, is so called from its habit of invading

gardens and making free with the ripe fruit—especially wall-fruit, amongst which its prime favourite is the peach. Except that it is somewhat smaller, it much resembles the fat dormouse, but it is not eatable. It makes its nest, like the rest of this genus, in the hollows of trees, or in the crevices of garden-walls. Its total length is about eight inches, and of this the tail occupies about an inch and a half. Its general colour is grey, deeply tinged with red upon the back, and becoming white upon the abdomen. The eyes are set in a black patch, which extends to some distance beyond each ear. Its tail is rather wide towards the end and sharp at the extremity; it is covered with short black hair, changing abruptly to white at the tip. It is common throughout the temperate parts of Europe and Asia.

Although not exactly of the genus *mus*, it would be a pity to exclude from these pages a short notice of that interesting little creature the shrew mouse. During the autumn months a walk along a country road will almost certainly discover one or two shrew mice dead and cold, and without any wound or other evidence to tell the reason why. As has been remarked by Mr. Wood, the presence of these deceased creatures is the more remarkable, because there are so many predatory animals and birds, such as cats, weasels, stoats, owls, and hawks, which would be very likely to kill such small prey, but having slain them would be almost sure to eat them.

To account for this phenomenon it has been suggested that the shrew, like the mole, is very impatient of hunger, and that when the approach of winter drives the worms deep into the earth, and the insects to their winter hiding-places, the unlucky shrew-mouse goes about poking its sharp snout here and there in search of a morsel, and not finding it falls down faint and exhausted, and dies where it is found.

Scarcely the raven himself was more hated and feared in the "good old times" than the innocent little shrew. Did a shrew run over a ploughman's boot, as he plodded through a field, the poor wretch instantly fancied himself "shrew-struck," and ran home in a fright to impart the doleful news to his horror-stricken family; if a horse died in a meadow, and its master discovered a shrew in the neighbourhood, he straightway cursed the whole shrew tribe, and troubled himself no farther as to the cause of his nag's demise; if, while singing on her stool, a little shrew-mouse rustled the petticoat of the milkmaid, her cheeks grew white as the rich milk in the pail, and, lest some

horrid thing should happen to herself or the cow, she was a miserable milkmaid for a week after.

But we cannot do our ancestors the injustice to assert that they submitted like cowards to the malice of the shrew. No. They invented all sorts of devices to meet their dreaded enemy. Here is one described by the historian of Selborne:—"At the south corner of the plestor, or area near the church, there stood about twenty years ago a very old grotesque pollard ash, which for ages had been looked upon with no small veneration as a shrew-ash. Now a shrew-ash is an ash whose twigs or branches, when applied to the limbs of cattle, will immediately relieve the pains which a beast suffers from the running of a shrew-mouse over the parts affected; for it is supposed that a shrew-mouse is of so baneful and deleterious a nature, that wherever it creeps over a beast, be it horse, cow, or sheep, the suffering animal is afflicted with cruel anguish, and threatened with the loss of the use of the limb. Against this accident, to which they were continually liable, our provident forefathers always kept a shrew-ash at hand, which, when once medicated, retained its virtue for ever. A shrew-ash was made thus: into the body a hole was bored with an auger, and a poor devoted shrew-mouse was thrust in alive and plugged in, no doubt with several quaint incantations long since forgotten."

That this banter of good old Gilbert White's was not undeserved, may be fully proved from many an ancient Natural History. Take, for instance, the "History of Four-footed Beasts and Serpents," published by Topsell, in the year 1658. Says this old-fashioned zoologist, speaking of the shrew,—"It is a ravening beast, feigning itself gentle and tame, but being touched it biteth deep and poisoneth deadly. It beareth a cruel minde, desiring to hurt anything; neither is there any creature that it loveth, or it loveth him, because it is feared of all. The cats, as we have said, do hunt it and kill it, but they eat not them, for if they do they consume away and die. They go very slowly; they are fraudulent and take their prey by deceit. Many times they gnaw the ox's hoofs in the stable. The shrew which by falling by chance into a cart-road or track doth die upon the same, being burned and afterwards beaten or dissolved into dust and mixed with goose-grease, being rubbed or anointed upon those which are troubled with the swelling coming by the cause of some inflammation, doth bring unto them a wonderful and most admirable cure and remedy. The shrew being slain or killed hanging, so that neither then nor afterwards she may

touch the ground, doth help those that are grieved or pained in their bodies with sores or boils. The shrew which dyeth in the furrow of a cart-wheel being found and rowled in potter's clay or a linnen cloth, or in crimson or in scarlet woollen cloth, and three times marked about the imposthumes which will suddenly swell in any man's body, will very speedily and effectually help and cure the same. The tail of a shrew being cut off and burned, and afterwards beaten into dust and applied or anointed upon the sores of any man which came by the bite of a greedy and ravenous dog, will in a very short space make both whole and sound, so that the tail be cut from the shrew when she is alive, not when she is dead, for then it hath neither good operations nor efficacy in it."

It is hard to conjecture how it came about that the poor little shrew-mouse should be regarded as such a baneful monster. True, it will fight like a fury with its own species—indeed, it is impossible to keep two in the same cage—and will devour its enemy should it have the luck to slay it; but that so small a creature should be able to terrify mankind, it is not easy to understand, especially considering its unoffending aspect and unobtrusive habits.

The shrew, in the form of its body and the texture of its fur, closely resembles the domestic mouse. The head, however, is totally different; the snout being long and tapering, the eyes very minute and almost hidden in the surrounding hairs, and the ears round and set very close to the head. The teeth are peculiar, the incisors being extremely long, and those of the upper jaw curved and notched at their base, while those of the lower jaw project almost horizontally. The tips of all the teeth are tinged with a reddish brown colour; which, by-the-by, as it might pass for blood-stain, may after all be the secret of the superstitious dread with which our forefathers regarded the little animal. Worms and insects are shrews' chief diet. The nest, which is usually made in a hole in a bank, is composed of dried herbage and is covered at the top, having an entrance at the side. Spring is the time for the shrew-mouse to bring forth its young, and usually five or seven is the number born.

THE HARVEST MOUSE.

It would seem that the indefatigable Gilbert White of Selborne was the first to take special notice of this pigmy of the genus *Mus*. Writing to his friend Pennant, he says: "I have

procured some of the mice mentioned in my former letter,—a young one and a female with young, both of which I have preserved in brandy. From the colour, size, shape, and manner of nesting, I make no doubt but that the species is nondescript. . . . . They breed as many as eight at a litter, in a little round nest, composed of the blades of grass or wheat. One of these I procured this autumn, most artificially platted, and composed of the blades of wheat, perfectly round, and about the size of a cricket-ball, with the aperture so ingeniously closed that there was no discovering to what part it belonged. It was so compact and well fitted that it would roll across the table without being decomposed, though it contained eight little mice that were naked and blind. As this nest was perfectly full, how could the dam come at her litter respectively, so as to administer a teat to each? Perhaps she opens different places for that purpose, adjusting them again when the business is over; but she could not possibly be contained herself in the ball with her young, which would, moreover, be daily increasing in bulk. This wonderful procreant cradle—an elegant instance of the efforts of instinct—was found in a wheat field, suspended in the head of a thistle."

Respecting the curious shape of the nest of the harvest-mouse, Mr. Wood is inclined to suppose that the little builder remained inside while engaged in its construction, and, after weaving it around her, pushed her way out through the loosely woven wall and rearranged the gap from the outside. It may be, he suggests, that the nest is the joint work of both sexes, one without the nest and the other within.

"As to the harvest mice," continues Gilbert White, "I have further to remark, that though they hang their nests for breeding up amidst the straws of the standing corn above the ground, yet I find that in the winter they burrow deep into the earth and make warm beds of grass; but the grand rendezvous seems to be in corn-ricks, into which they are carried at harvest. A neighbour housed an oat-rick lately, under the thatch of which were assembled nearly a hundred, most of which were taken, and some I saw I measured, and found that from nose to tail they were just two inches and a quarter, and their tails just two inches long. Two of them in a scale weighed down just one copper halfpenny, which is about the third of an ounce avoirdupois; so that I suppose they are the smallest quadrupeds in this island. A full-grown domestic mouse weighs, I find, an ounce lumping weight, which is more than six times as

much as the mouse above, and measures, from nose to rump, four inches and a quarter, and the same in its tail."

It is useless to attempt to breed harvest mice in a state of bondage; it has been attempted many times, and with considerably more care than any reader of this book will be disposed to devote to the matter, and the invariable result has been disappointment. The young are devoured as soon as they are born. So rarely is this the exception, that there is preserved in the Museum of the Royal College of Surgeons the tiny offspring of a tame harvest-mouse, and it is justly regarded as one of the smallest placental quadrupeds that ever breathed.

It was for a long time supposed that the harvest-mouse was strictly granivorous in its habits; this error, however, was abolished many years ago by Mr. Bingley. He says: "One evening, as I was sitting at my writing-desk, and the animal was playing about in the open part of its cage, a large blue-bottle fly happened to buzz against the wires. The little creature, although at twice or thrice her own length from it, sprang along the wires with the greatest agility, and would certainly have seized it, had the space between the wires been sufficiently wide to have admitted her teeth or paws to reach it. I was surprised at this occurrence, as I had been led to believe that the harvest-mouse was merely a granivorous animal. I caught the fly, and made it buzz in my fingers against the wires. The mouse, though usually shy and timid, immediately came out of her hiding-place, and, running to the spot, seized and devoured it. From this time I fed her with insects whenever I could get them, and she always preferred them to every other kind of food I could offer her."

MOUSE STORIES.

That mice as well as rats will desert a falling house we have the authority of Topsell. "It is very certain," he says, "that mice which live in a house, if they perceive by the age of it it be ready to fall down, or subject to any other ruin, they foreknow it and depart out of it, as may appear by this notable story which happened to a town called Hellice, in Greece, wherein the inhabitants committed this abominable act against their neighbours, the Greeks; for they slew them and sacrificed them upon their altars; whereupon followed the ruin of the city, which was permonstrated by this prodigious event. For five days before the destruction thereof, all the mice, weasels,

and serpents, and other reptile creatures went out of the same in the presence of the inhabitants, every one assembling to his own rank and company; whereat the people wondered much, for they could not conceive any true cause of their departure, and no marvail; for God, which had appointed to take vengeance on them for their wickedness, did not give them so much knowledge, nor make them so wise as the beasts to avoid his judgement and their own destruction; and, therefore, mark what followed. For these beasts were no sooner out of the city but suddenly in the night time came such a lamentable earthquake and strong tempest, that all the houses did not only fall down and not one of them stood upright to the slaughter of many women and children contained in them, but lest any of them should escapo the strokes of the timber and housetops, God sent also a great flood of waters by reason of the tempestuous wind, which drove the waters out of the sea upon the town, that swept them all away, leaving no more behind than naked and bare significations of former buildings. And not only the city and citizens perished, but also there were ten ships of the Lacedemonians in their port all drowned at that instant."

Jesse relates that soon after the completion of the new plantation, made by order of Government in Dean Forest, Gloucestershire, the place was suddenly besieged by such immense armies of long and short-tailed mice as to threaten the speedy destruction of the whole of the young plants. Vast numbers, according to the above-mentioned naturalist, of the young trees were killed, the mice having eaten through the roots of five-year oaks and chestnuts generally just below the surface of the ground. Hollies, also, which were five and six feet high, were barked round the bottom; and, in some instances, the mice had got up the tree, and were seen feeding on the bark of the upper branches. In the report made to Government on the subject, it appeared that the roots had been eaten through wherever they obstructed the run of the mice; but that the bark of the trees constituted their food was ascertained by confining a number of the mice in cages and supplying them with the fresh roots and bark of trees, when it was found that they fed greedily on the latter and left the former untouched. Various plans were devised for their destruction; traps were set, poison laid, and cats turned out, but nothing seemed to lessen their number. It was at last suggested that if holes were dug into which the mice might be enticed, their destruction might

be effected. Holes, therefore, were made about twenty yards asunder in some of the Dean Forest plantations, being about twelve in each acre of ground. These holes were from eighteen to twenty inches in depth, and two feet one way by one and a half the other; and they were much wider at the bottom than the top, being excavated, or hollowed under, so that the animal when once in could not easily get out again. In these holes at least thirty thousand mice were caught in the course of three or four months, that number having been counted out and paid for by the proper officers of the forest.

It was, however, calculated that a much greater number were taken out of the holes by stoats, weasels, kites, hawks, and owls; and also by crows, magpies, jays, &c. The cats, also, which had been turned out resorted to these holes to feed on the mice; and, in one instance, a dog was seen greedily eating them. In another an owl had so gorged itself, that he was secured by one of the keepers. As the mice increased in number so did the birds of prey, of which, at last, there were an incredible number. In addition to the quantity above mentioned, a vast number of mice were destroyed in traps, by poison, and by animals and birds, and it was found that in the winter, when their food fell short, they ate each other, so that in Dean Forest alone the number which was destroyed in various ways could not be calculated at less than one hundred thousand, and in the New Forest the mortality was equally great. These calculations are made from the official weekly returns of the deputy-surveyors of the forest, and other sources.

Next and last is a legend showing how insignificant is the might of the most powerful man in the eyes of his just Maker; and how that, if He wills it, the mightiest man in his realm may flee before a little mouse, and that the little mouse may slay him, and pick his arrogant bones:—

"It happened in the year 914 that there was an exceeding great famine in Germany, at which time Otho, surnamed the Great, was emperor. One Hatto, an abbot of Fulda, was archbishop of Mentz, of the bishops after Crescens and Crescentius the two-and-thirtieth, of the archbishops after Saint Bonifacius the thirteenth. This Hatto, in the time of this great famine aforementioned, when he saw the poor people of the country exceedingly oppressed with famine, assembled a great company of them into a barn, and, like a most accursed and merciless catiffe, burnt up those poor innocent souls, that were so far

from doubting any such matter that they rather hoped to receive some comfort and relief at his hands.

"The reason that moved the prelate to commit that execrable impiety was because he thought the famine would the sooner cease if these unprofitable beggars that consumed more bread than they were worthy to eat were despatched out of this world.; for he said that these poor folks were like to mice that were good for nothing but to devour corne. But God Almighty, the just avenger of the poor folk's quarrel, did not long suffer this hainous tyrany, this most detestable fact, unpunished; for He mustered up an army of mice against the archbishop, and sent them to persecute him as his furious Alastors, so that they afflicted him both day and night, and would not suffer him to take rest in any place. Whereupon the prelate, thinking that he should be secure from the injury of the mice if he were in a certain tower that standeth in the Rhine near to the towne, betook himself unto the said tower, as safe refuge and sanctuary from his enemies, and locked himself in; but the innumerable troops of mice chased him continually very eagerly, and swamme unto him upon the top of the water to execute the just judgement of God; and so at last he was most miserably devoured by those sillie creatures, who pursued him with such bitter hostility that it is recorded they scraped and knawed out his very name from the walls and tapestry wherein it was written, after they had so cruelly devoured his body. Wherefore the tower wherein he is eaten up by the mice is shown to this day for a perpetual monument to all succeeding ages of the barbarous and inhuman tyrany of this impious prelate, being situate in a little green island in the midst of the Rhine, near to the town of Wingen, and is commonly called, in the German tongue, the Mouse-tower."

The clever author of "Animal Life" gives us a humorous dissertation on mouse-catching, which I will take the liberty of here reprinting, not that it is likely to be of much service to mouse-keepers, but rather as a peace-offering to those outraged personages hinted at in the opening of this chapter.

It is not so easy to clear a house of mice as many people imagine, particularly if traps are used as a means of destruction. Many will be caught when the traps are first set, but the numbers fall off and at last cease altogether, when the householder flatters himself that the mice are all gone. But the fact is the little creatures have learned caution, and have only avoided entering the trap while they continue their depre-

dations. They not only take warning from seeing their fellows caught, but if one that has been captured be suffered to make its escape the trap may as well be removed, for no more mice will be caught. After a month or two it may again be used with success.

"During my residence at college, the mice had been a fertile source of annoyance. They nibbled my candles in two, so that they would not stand upright; they drank my milk; they pattered with their little feet over my butter; they raced about between the papered canvas and the stone wall until the wall was riddled with holes, made by a toasting-fork thrust through the paper in the vain hope of spearing them; they would run across my carpet in the most undisguised manner, until I resolved to extirpate them. So I got a double trap, baited it very temptingly, and set it in the closet. Scarcely had the door been closed when two smart blows told of the capture of two mice. They were speedily immolated and the trap set again. During the first two or three days the trap was constantly going off, until I was tired of going and taking out the mice. The others, however, took warning and came more and more sparingly, until it was a rare thing to catch one young mouse in a day, and after a week or so none were caught at all, although the trap was baited with most savoury toasted cheese, and my candles suffered as before. I then bethought me of changing the bait, so after suffering the trap to be well aired and the scent of the cheese to evaporate, I substituted a piece of tallow with great success, for the mice came nearly as fast as ever. When they began to dread the latter, a piece of bacon was used as the bait, and by systematically changing the bait great numbers were caught. At last, however, the mice seemed to comprehend that the trap was in fault and not the bait, and I had to substitute a four-trap, in which they again came in multitudes, and as the descending weight was a very large book several perished at once."

The disadvantages of letting a captured mouse escape are three-fold. In the first place he consumes your bait profitlessly; in the second he conveys to his friends the full particulars and secret of your trap, and counsels them to avoid it; and in the third place you may pretty safely rely that he himself will never again be trapped, however artful may be the snare and tempting the bait. Dr. Alfred Smee relates a curious instance of this in his "Instinct and Reason." He captured a common mouse, and instead of consigning it to the pail, or the jaws of

the cat, preserved its life. At the time, Dr. Smee was attached to the offices of the Bank of England, and occupied a room, the floor of which was stone and the walls bare and solid. The mouse escaped, and as Dr. Smee says "as the presence of a wild mouse in the room was undesirable I took measures to secure it. There was no hope for him that he would ultimately escape, although there were abundant opportunities for hiding I set the trap and baited it with a savoury morsel; but day after day no mouse entered. The poor little thing gave unequivocal signs of extreme hunger by gnawing the bladder from some of my chemical bottles. I gradually removed from the room everything he could possibly eat, but still the old proverb, 'Once caught twice shy,' so far applied that he would not enter my trap. After many days, on visiting the apartment, the trap was down and the mouse caught; the pangs of hunger were more intolerable than the terrors of imprisonment. He did not, however, accept the unpleasant alternative of entering the trap until he was so nearly starved that his bones almost protruded through his skin, and he freely took bits of food from my fingers through the bars of his cage."

PET MICE AND THEIR CAGE.

The keeping and breeding of "fancy" mice is such a simple matter that very few lines will suffice for its treatment.

As to the best sort of mouse to "pet," this much may be said, that whatever colour may be selected, none will be found so docile and so easy to tame as the vulgar little brown mouse. White mice, or grey and white, or cinnamon and grey, may lay claim to greater personal attractions, but they are never so healthy as the common brown mouse, never so tractable, and, according to my experience, never so clever.

Supposing you to be on mouse-breeding bent, first of all prepare the cage. Let it be a large cage, in which there are three compartments: a large one, with wire sides and roof; a sleeping-room, with wooden walls and ceiling (the latter sliding in grooves), and by the side of this a spare room, with an entry into the open cage, but so contrived that egress may be stopped at pleasure. This last-mentioned chamber, which should, like the other, be furnished with a sliding roof, is for the temporary imprisonment of the "boar" when his wife brings him a fresh troop of young ones. Sometimes father mouse is amiable and good-natured, but sometimes—capital fellow as he may be on ordinary occa-

sions—he will, should mother mouse present him with a litter, take on himself the behaviour of a ruffian—nay, of a cannibal, and devour them, body and bones, before her eyes. Therefore, when the interesting event is at hand, box him up straight off.

It is a mistake to suppose that the mouse delights in the unpleasant odour his presence in a confined space is sure to generate. You may depend he dislikes it as much as we do, and is very delighted to have his house tidied up, and a fresh bed laid. To ensure proper cleanliness, the entire dwelling should have a double floor, and the upper floor should be drawn out and scraped at least every other day. The perches and tiny brackets round the open cage should be movable, and taken out and cleaned as often as the false bottom. By the bye, it should be mentioned that a goodly number of these perches and bars and brackets should be adjusted in what may be called the mouse's day-room. The little creatures will be found to take full advantage of these accessories to climbing and swinging and leaping, and it is much better exercise for them than struggling and panting and clutching at nothing in a revolving cylinder.

Always be careful, when you remove the bottom of the cage to clean it, that it is perfectly dry before you replace it. As to bedding, almost anything that is soft and easily spread—a little cow-hair or white wadding will do; but there is one thing that will *not* do, and that is wadding that has been dyed black. Whatever your breed of mice may be, a night's lodging on black wadding will pretty certainly kill them.

Should the reader be induced to avoid the expense of purchasing white or party-coloured mice, and to try his hand on the common brown sort, he has nothing to do but to procure a few mice not more than a month or six weeks old. They will, of course, be savage enough at first, but a fast of two, or at most three days, will generally reduce them to so tame a condition that they will come to the bars and eat from your hand. Let them, after a moderate meal, fast again for a day, and, when you approach the cage with some such sound as you used when last you fed them, they scramble to the front, and squeak their delight at renewing your acquaintance. If after this you are not friends, do not blame the mice, but set yourself down as an individual unpossessed of the knack of mouse-taming.

THE GUINEA PIG.

This neat little animal has stood its ground as a "Home Pet" from as remote a period as the discovery of America by Europeans. Never was an animal so misnamed, as it has not the remotest connexion with the pig family, and instead of being found in Guinea it is a native of South America. Domestication seems to have completely revolutionized the appearance and habits of the Guinea pig. The colours borne by the animal with which we are familiar, are never seen with the wild animal busy with their domestic affairs among the Bromelia Groves of Paraguay. Again, one of the chief characteristics of the domesticated Guinea pig is its extreme fecundity, six litters of eight each being no uncommon number for this little animal to produce in the course of a single year, whereas, in a wild state, according to Dr. Reugger, it breeds but once a year, and then brings forth but one, or at most two, little ones. Darwin relates that the wild Guinea pig is common in the neighbourhood of several towns on the banks of the Rio Plata, where it is known as the Aperea. Where the soil is dry it makes a burrow, but otherwise it lies concealed among the herbage. It generally comes out to feed in the evening, as do the rabbits, between which and the mice the Guinea pig would seem to form a connecting link.

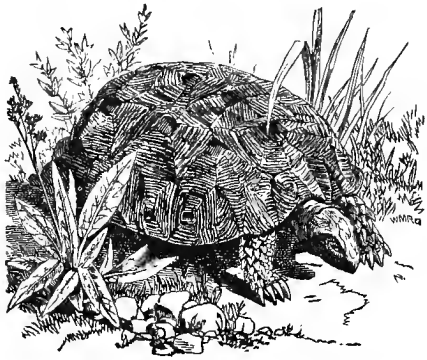
The Guinea pig is of little direct use to mankind. Its flesh is unfit for food; and its hide, on account of the slight attachment of the fur to the skin, is unavailable for furriers' pur-

poses. Nevertheless, it is a pretty pet, and an observance of its habits, especially its scrupulous cleanliness as regards its coat, will repay the attention it is necessary to lavish on it. "There was formerly a prevalent idea," writes a modern naturalist, "that rats had a special antipathy to the Guinea pig, and would not haunt any place where one of these animals was kept. Rabbit-owners were therefore in the habit of placing a Guinea pig in the same apartment with the hutches, in hopes of scaring away the rats, which are the chief enemies of tame rabbits. As, however, in several instances the Guinea pigs were eaten by the rats instead of driving them from the premises, the custom has gradually fallen into deserved disrepute."

The Guinea pig's cage should be well defended against cold and damp, as unless the animals are kept perfectly warm and dry they will never thrive. Like the rabbits, they prefer gloom to light, and thrive very well in a portable hutch built on the same principle, but of lighter material and more elegantly, if it were desired, than that recommended in this volume for rabbits. As regards drink, the remarks made in the case of the rabbits apply also to the Guinea pig. The animal is very fond of milk.

As regards food, any sort of vegetable food seems acceptable to the Guinea pig; herbs of most kinds may be given it, not forgetting an occasional sprig of parsley, of which it is specially fond. Carrots and carrot-tops, apples, oats, and tea-leaves, may be safely placed in the hutch.

The female goes with young three weeks, and after suckling them for three weeks turns them off to shift for themselves. When first born the little pigs have their eyes open, and are covered with hair. They do not, however, attain perfect growth till the age of eight months, soon after which they will begin to reproduce their species.



THE TORTOISE.

This is another creature whose claims to be "petted" rest not at all on its merits or its utility, but solely on the fact that on account of its curious structure and habits it has been kidnapped from its native land, where, in a state of freedom, it was quite competent to conduct the business of its life, and brought to a foreign clime, and so placed that its natural talents avail it nothing, and it is quite helpless and at our mercy.

Without doubt, the tortoise belongs to a family the most marvellous in the world. Their feet are little better than stumps, the toes being only indicated externally by what may be termed a collection of hoofs, placed, as in the elephant, on the circumference of the apology for a foot, and which serves so to speak, as a sort of grappling to hold on the surface of the ground, and drag the armed trunk forwards; their ponderous shells, over which a waggon-wheel might roll with impunity, are so sensitive that the pattering on them of a shower of rain is an annoyance the creature will make prodigious exertions to escape; their tenacity of life is without parallel; indeed, they would seem almost impregnable against the assaults of the most formidable enemies to existence. The most cruel experiments have been practised on the creature, and with most singular results.

We are told that in a certain November, the celebrated Redi made a large opening in the skull of a land-tortoise, extracted the brains and cleaned out the cavity. He then set the animal

at liberty, and it groped its way freely about wherever it pleased, as if it had not been injured. Redi makes use of the term "groping," because, he says, that when the tortoise was deprived of its brain it closed its eyes, which it never again opened. The wound which was left open skinned over in three days, and the tortoise, continuing to go about and execute other movements, lived to the middle of May. On a post-mortem examination the cavity which the brain had occupied was found empty and clean, with the exception of a small dry and black clot of blood. He repeated this experiment upon many other land-tortoises in the months of November, January, February, and March, with this difference, that some were locomotive at their pleasure, whilst others, though they made other motions, did not move about: he found the same results when he treated fresh-water tortoises in the same manner, but they did not live so long as the terrestrial species. He states his belief that the marine tortoises would live a long time without their brain, for he received a turtle which he treated in the same way, and though it was much spent and faint from having been long out of the sea, it lived six days. In November he deprived a large tortoise of its head, without which it continued to live twenty-three days: it did not move about as those did whose brain had been taken out, but when its fore or hind legs were pricked or poked, it drew them up with great strength, and executed many other movements. To assure himself beyond all doubt that life, such as it was, continued in such cases, he cut off the heads of four other tortoises, and on opening two, twelve days afterwards, he saw the heart beat and the blood enter and leave it.

The common tortoise, at least that most common to us, is a native of almost all the countries bordering on the Mediterranean sea, and is more frequent in Greece than elsewhere. It is found in the scattered islands of the Archipelago, and in Corsica, and Sardinia; it occurs likewise in Africa. The general length of the shell of this species is from six to eight inches long; and the weight of the full-grown animal about four or five pounds. The shell is of an oval form, extremely convex on the upper part, and composed of thirteen middle pieces, and about twenty-five marginal ones. The middle pieces or those constituting the disc of the shield, are mostly of an oblong-square form, and of a dark-brown colour, varied by a broad yellow, or citron band running along one side of each, and continued about half-way along the upper part; there is

also an oblong patch of a similar colour running down the side of each. The colours of the shell are more or less bright in the various specimens, and are subject to some occasional variations, as well as sometimes in the shape of the pieces themselves. The under part of the shell is of a citron or pale yellow colour, with a brown band on either side, and the centre plain. The head is rather small; the eye small and black; the mouth not extending beyond the eyes; the legs short with broad feet strongly covered with scales, and furnished each with four substantial claws. Sometimes, however, there are five claws on the fore-feet. The tail, which is very short, is covered with small scales, and terminates in a pointed tip, naked and horny. As to the precise age the tortoise may attain nothing is with certainty known. There is, however, still preserved in the library at Lambeth Palace, the shell of a tortoise which was familiar with the palace garden in the time of Archbishop Laud, about the year 1633; and there it continued to reside in perfect health till the year 1753, when, being ousted from its winter quarters by a clumsy gardener, and left exposed to a bitter frost, it was next morning found dead.

The best advice that can be given to persons desirous of keeping a tortoise is to allow it the run (it will not run away) of a garden where grow plants of the juicy order, such as the lettuce, the sow-thistle, and the dandelion, and then leave it entirely to its own devices. During the summer months it will crawl about in a lazy, happy way, eating moderately, sleeping soundly, and troubling nobody. As winter approaches if it is let alone it will probably dig itself a grave in a flower-bed and bury itself comfortably till the sun's returning warmth rouses him from his lengthy nap, and he scrambles out of bed to begin another summer. If any further information is requisite it is to be found in Gilbert White's Journal, in which very frequent mention is made of the tortoise Timothy, purchased by the good pastor of Selborne, of old Mrs. Snooks. A few of the most pertinent remarks about Timothy Tortoise will be very well worth while extracting from the said Journal and here printing.

"March 17. Brought away old Mrs. Snooks's tortoise Timothy, which she valued very much, and had treated kindly for nearly forty years. When dug out of its hybernation it resented the insult by hissing.

"May 14. Timothy travelled about the garden.

"May 2. Timothy eats.

"April 19. Timothy, who had withdrawn himself for several days, appears.

"March 15. Timothy comes forth and weighs 6lb. 5½oz.

"May 9. Timothy eats dandelion leaves and stalks. He swallows his food almost whole.

"Sept. 19. Timothy forsakes the fruit wall and retires to the laurel edge, where he will lay himself up hereafter.

"April 14 Timothy has become very alert and marches about the walk.

"Sept. 18. Timothy eats voraciously.

"Dec. 3. Timothy has laid himself under the hedge against Benham's yard in a very comfortable, snug manner. A thick tuft of grass shelters his back and he will have the warmth of the winter's sun.

"Sept. 29. Timothy eats grass. Token that the weather is warm.

"June 4. Timothy took his usual rambles, and could not be confined within the limits of the garden. His pursuits, which are of the amorous kind, transport him beyond the bounds of his usual gravity at this season. He was missing for some days but found at last near the upper malt-house.

"Sept. 17. When we call loudly through the speaking-trumpet to Timothy he does not seem to regard the voice.

"June 20. We put Timothy into a tub of water, and found that he sank gradually and walked at the bottom of the tub. He seemed quite out of his element and was much dismayed.

"April 19. Timothy enlarges his breathing-hole and lifts up the earth.

"April 21. Timothy heaves up the earth and puts out his head.

"April 22. Timothy comes forth and walks about.

"May 2. Timothy marches about and eats a piece of cucumber-paring.

"Nov. 27. Timothy sleeps in the fruit border under the wall, covered with a hencoop, in which is a good armful of straw. Here he will lie warm, secure, and dry. His back is partly covered with mould."

Darwin, in describing the reptiles common to the Galapagos Archipelago, makes mention of a gigantic tortoise found at a place called Chatham Island. Six hundred men, he declares, might subsist on them without any other provision, while they are so fat and deliciously flavoured as to equal the best bred chickens. These tortoises, he says, when moving towards any

definite point, travel by night and day, and arrive at their journey's end much sooner than would be expected. The inhabitants of the island, from observations on marked individuals, consider that they can move a distance of about eight miles in two or three days. One large tortoise, which Darwin watched, walked at the rate of sixty yards in ten minutes, that is, three hundred and sixty in the hour, or four miles a day—allowing it also a little time to eat on the road. The flesh of this animal is largely employed by the natives, the fat being stewed down for oil. When a tortoise is caught its captor makes a slit in the skin near the tail, so as to see inside its body whether the fat under the dorsal plate is thick. If not, the animal is liberated; and it is said to recover very speedily from the unceremonious test to which it has been subjected.

HUBER THE BLIND NATURALIST.

THE BEE.

HERE we have a Home Pet of the very highest order; for not only does its study bring teeming profit in the shape of so many pages revealed of Nature's wonderful economy, and, still more profitable, of the infinite wisdom and goodness of the Creator, but the bee-keeper has ever at hand a pattern of industry and cheerfulness, of content, of proper submission to authority, which is only another term for loyalty,—of thrift, and of valour. As truly says a writer of a bygone age, "In their labour at home and abroad, they may be a pattern with men; for unless they are hindered by weather, weakness, or want of stuff to work upon, their labour never ceaseth, and, for their order, it is such

that they may well be said to have a commonwealth, since all they do is in common, without respect to private interest: they work for all, they watch for all, and they fight for all.

Of all the poets or prose writers that ever took up pen on behalf of the little wax and honey-maker, not one ever accomplished his task with such compact beauty and completeness as Shakspeare in his play "Henry V.:"—

"So work the honey bees,
Creatures that by a rule in nature teach
The act of order to a peopled kingdom.
They have a king and officers of sorts:
Where some like magistrates correct at home;
Others like merchants venture trade abroad;
Others like soldiers armèd in their stings,
Make boot upon the summer's velvet buds;
Which pillage they with merry march bring home—
To the tent royal of their emperor:
Who, busied in his majesty, surveys
The singing masons building roofs of gold;
The civil citizens kneading up the honey;
The poor mechanic porters crowding in
Their heavy burdens at his narrow gate;
The sad-eyed justice, with his surly hum,
Delivering o'er to executors pale
The lazy, yawning drone."

At the very outset, the bee question presents a marvellous feature—how are bees generated? So long ago as the time of Virgil the matter was discussed, and, by the last-mentioned philosopher, thus quaintly accounted for:—"First, there is found a place, small and narrowed, for the very use, shut in by a little tiled roof and closed walls, through which the light comes in askant by four windows, facing the four points of the compass. Next is found a two-year-old bull-calf, whose crooked horns are just beginning to bud. In spite of his kicking, the nose-holes of the beast are stopped, and after he has been thumped to death, his entrails, bruised as they are, melt inside his entire skin. This done, he is left in the place afore prepared, and under his sides are put bits of boughs and thyme and fresh-plucked rosemary. In time, the warm humour begins to ferment within the soft bones of the carcase, and, wonderful to tell, there appear creatures, footless at first, but which, soon getting unto themselves wings, mingle together and buzz about, joying more and more in the airy life. At last burst they forth, thick as rain-drops from a summer cloud,

thick as arrows which leave the clanging strings of the Parthians when they make their first onslaught."

Whether or no the efficacy of this mode of bee-breeding has been tested in modern times, I can't say; in my opinion, however, a two-year-old bull-calf "in hand" is preferable to a swarm of bees "in the bush."

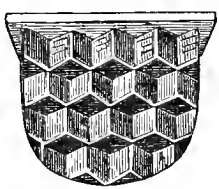
Another theory, much more elegant, but equally erroneous with the above, was that they never generate, but spring from the flowers. Many other theories, more or less fanciful, have been from time to time ventured on this subject; but it is doubtful if the most imaginative man could have invented a fiction half so bewildering as what appears to be the *fact;* which is this, that the queen bee is capable of producing fertile eggs in her virgin state, and without a union with the other sex! This, be it borne in mind, is not the dream of a philosopher, but the cool and deliberate opinion of profoundly learned men and diligent experimentalists, among whom may be mentioned Siebold, Cuvier, and Samuelson. It would seem, however, that the only sort of bees who may justly claim never to have but one parent, are the males, or *drones;* when the queen bee mixes with drone society, the result is *working bees,* which, although of the female sex, are incapable of perpetuating their kind. True, she does give birth to a limited number of fruitful females; but of the entire number that may be born in a single hive, *only one* (who, in her turn, takes the command of the straw-encompassed kingdom) is suffered to live.

Passing by, for the present, this interesting feature of bee-life, we will endeavour to describe the ordinary business of the beehive. Supposing a swarm, together with their queen, to have wintered together, and to be transferred, when the spring comes round, to a new hive. After spending a few hours in thoroughly investigating the new premises, certain bees of an architectural turn, and known as *foundress bees,* proceed to sketch out the shape the combs should be, and lay the foundation-stone, as it were. This is accomplished by applying a tiny mass of wax, properly kneaded and prepared by the labourers, and plastering it against the roof, sides, or floor of the hive; more wax is added to the first slab, and when enough is accumulated, the labourers come up, and with their jaws make a little hollow where the top cell ought to be; then they form two others a little below it, one right and left,

FOUNDRESS BEE.

and so on, relieving each other from time to time through the day, till the comb is completed. When finished, the combs comprise a congeries of hexagonal cells, each comb being composed of two ranges of cells, backed against each other, the partition between each double row being so disposed as to form a pyramidal cavity at the bottom of each. Between these double combs there is a road just wide enough to admit the passage of two busy bees without jostling.

As soon as the cells are in readiness, intimation of the fact is conveyed to her majesty the queen bee, who at once proceeds to lay her eggs. She has three sorts of eggs to deposit,—worker eggs, drone eggs, and princess eggs, and the cells prepared for the reception of each differ in shape from the other. The "worker" cells are smaller and neater than the drone cells, and those intended for the reception of royal eggs are more commodious still. Now, if her majesty the egg-laying queen had the handling of each egg before it was put away, it would account for the fact that in no instance is a mistake ever made in assigning the wrong cradle to this insect or that; but as she, attended by her obsequious body-guard, simply inserts the hinder part of her body into each cell, and at the rate, according to Reaumur, of two hundred a day, one does not exactly see how she distinguishes one egg from another with such unerring accuracy. Huber once tested this during her period of egg-laying. He confined a queen bee, so that she could get at nothing but drone cells: at once, she discontinued laying altogether; and it was only when she had failed in her repeated efforts to escape, and nature forbade her to retain the eggs any longer, that she dropped them, letting them fall where they might. After all, however, this is rather a matter for awe than speculation; without doubt, the bee of itself knows nothing of this egg or that, and surely it is not more wonderful that He who has all creation at His finger's tip, should direct the nature of the little bee as well as of the fierce rhinoceros or the nervous ostrich.



ARRANGEMENT OF CELLS.

The bee's egg is a small colourless speck, and is deposited at the very bottom of its cell. At the end of four days, there emerges from this speck a little dingy-white worm, possessing, as far as the naked eye can observe, no sign of external mem-

bers; and by this time, the bees whose duty it is to nurse the little strangers have poured into each cell a drop of diluted honey, and in this the little maggot lies curled up. When the nurses know that the fat little worm is approaching bee-hood, they plaster over the mouth of its cell and leave it to itself. Then the prisoner sets about spinning for itself a silken cocoon (the queen larva accomplishes this task in about twenty-four hours, the worker in not less than thirty-six hours), and in this it lies enveloped till the metamorphosis is complete, and, becoming a perfect bee, it first bursts its silken bonds, and then the door of its dungeon, and another subject is added to the hive. Its first journey is to the lighting-board in front of the hive, that the sun may dry its damp little body; while an old bee kindly busies itself to straighten and smooth the hairs that cover its limbs, just as a chicken picks out the feathers of her little one just emerged from the shell.

This is pretty much the way in which plebeian bees are treated—with those of royal blood it is altogether different. It should have been stated that the time occupied from the deposition of the egg to the final appearance of the worker bee is about twenty days, for the drone twenty-four days; but for the princess bee sixteen days suffice. When one of the royal brood is ready to emerge from her prison, there is a great commotion in the hive, and the populace cease work, and for a little time make holiday to welcome the auspicious stranger. The queen-mother too approaches, but with quite different feelings from those which actuate her subjects. Her designs are of a sanguinary character; she is eager for her daughter to emerge, that she may fall on and murder her.

Luckily for the poor little princess, however, the devotion of the populace is not so blind as to allow, without interference, such cold-blooded atrocity. They gather round the royal cell, and, instinctively knowing the queen's evil intent, guard the entrance, and in the event of her majesty growing ferocious, or her daughter impetuous, do not scruple to bring beams of wax and erect a strong door; so keeping the rivals apart till the old queen, unable longer to control her royal indignation, sweeps out of the hive, generally accompanied by a troop of courtiers and a host of labourers, who are willing to follow the fortunes of their sovereign, whatever they may be. When this

QUEEN BEE.

takes place, bee-keepers make ready fresh hives for the malcontents, and say the bees are "swarming."

Sometimes, however, and by an unlucky coincidence, *two* princesses will emerge from their embryo state at the same hour. On such occasions the malicious old queen, knowing the pretty quarrel there will presently ensue, takes herself off with her friends, and leaves her children to settle their differences how they please. There is only *one* way of settling them. Such a thing as *two* queens in one hive was never yet known; they are equally respected to the hiveites; but what they want is a queen in place of her who has departed; either will do; let them settle it between them. The princesses must fight for it.

While the inhabitants of the hive stand aside, the rival queens advance, and gripping each other with their jaws commence the deadly struggle; finally the luckier one perceives a chance for a thrust; it is given; of the two royal bees but one is left alive, and while the multitude hail the assassin as their queen and pay her homage, the body of her rival is thrown out. If this account be not strictly and exactly true, the responsibility rests with M. Vogt, the famous German naturalist, and not with me.

It has been shown that two queens cannot reign in the same hive; that law is, however, not more imperative than that without a queen at all the hive cannot exist. This law would seem to involve serious dilemmas. Queen bees, like the commonest of their subjects, are but mortal, are as liable to fatal accident, and when they venture abroad may as likely never return. Such things do happen, and, worse than all, when there is not a single royal egg-cell tenanted. But by a wise provision of nature the bereaved bees are equal to the emergency. *They make a queen out of a working bee.*

Ignorant of bee-nature, the reader may see little reason for italicising this last sentence. "What can be easier?" he may say; "the same sort of thing has been done by ourselves, or at least by our French neighbours, and more than once. Suppose an emperor be removed from his throne by death to-day, and the multitude be mad enough to place on the throne the first cobbler or bargeman they may meet, you have the vacant throne at least filled, though perhaps not efficiently."

Gently, dear reader. A plebeian queen can no more be tolerated in bee-land than an empty throne, and though a bee might be ever so well qualified to fill the throne, unless she were of the orthodox *shape*, death would be the penalty of the

merest whisper of her ambitious designs. Besides, it would be impossible for a common bee to become queen, as it is the queen's *sole* business to populate the hive, and, as has already been observed, the power of propagation is denied the working bee. The physical differences between the queen bee and the working bee are broad and unmistakable. The worker has strong jaws to knead wax and carry building material; the jaws of the queen are delicate things, not half the size or strength: the workers have a long proboscis with which they collect honey from flowers in their business jaunts; it is no business of the queen to gather honey, and so her proboscis is just long enough to supply her with food, and that is all: the worker's wings are a third longer than the queen's, though her body is much longer and heavier than theirs; her legs are smooth and delicate, theirs are rough and hairy; the sting of the worker is long and strong—a Border spear, compared with which the weapon of her majesty is the merest stiletto.

Thus you see, for a dozen reasons, a worker bee is vastly different from a royal bee, and it would greatly puzzle the united science of the whole world to transform the plebeian bee into the royal. The secret, however, is known to the bees, and is commonly practised by them: it is simply a matter of commodious cradle-room and superior feeding. It has been already observed that the cell of the worker egg is much smaller than that of the queen, and it may here be observed that the food of the two when they reach larva-hood is likewise different. In the first three days royal and common grubs are fed alike, on what naturalists call "royal" paste, which is pure honey prepared in a certain way by the nurse-bees. After the third day, however, a more common diet is substituted in the case of the workers; pollen is mixed with the honey, and on this vulgar food they grow to be submissive labourers. In the case of the royal larva the food is never changed—"royal" paste is its sole food, and by-and-by it kicks out of its roomy cradle a long-bodied, short-winged, thorough princess.

Well, finding themselves without a queen and without a royal egg, the workers select a cell containing a worker egg, and at once proceed to demolish the partitions of the cells that surround it, that it may have royal room. When the lucky larva bursts into life, it is treated with the same attention as though it was of royal stock; nothing more common than "royal" paste is ever offered it, and lo! there presently issues from the jealously-guarded cell an insect "every inch" a queen.

THE MANAGEMENT OF BEES.

As to whether straw hives or wooden boxes are best for bees I shall not pretend here to determine. Supposing one to be as good as the other, I should decidedly vote for straw hives as more picturesque and comfortable looking. "Now some of yon," says Dr. Cotton, in his "Bee Book," "do not fancy wooden boxes, because you say the bees do not like them. Now I would ask whether wild bees live in *wooden* trees or in trusses of straw." Surely if this is an example of the arguments of the anti-straw party it is no wonder, on principle of like to like, that they show such affection for things *wooden*. On the same principle it would be only fair to assume that, whereas the harvest-mouse delights, when wild, in the freedom of the broad corn-field, the way to make him happy in a domestic state is to enclose him in a dumpling of wheaten dough.

Supposing the form of hive adopted by the amateur bee-keeper to be the common bell-shape, and made of straw (and without doubt the beginner will run less risk of bungling and, consequently, of disappointment with this than any other), it will be as well to observe the following hints as to its construction and arrangement, as furnished by Dr. Bevan. "In making these hives the lowest round of straw should be begun upon a wooden hoop, the bottom being planed smooth that it may sit closely upon the floor-boards, which, besides making mortar or other cement needless, will allow a more easy movement of the slide in the floor-board. Hives on stone or plain board must of course have entrances cut in the wooden hoop three inches long, and three-eighths of an inch high. The hoop

shonld be perforated through its whole course, the perforations being made in an oblique direction, so distant from each other as to cause all the stitches of the hive to range in an uniform manner

"The hoop may be first pierced with a gimlet, and the holes completed by a very small rod of hot iron introduced from the inner side of the hoop, so flattened as to make the perforation correspond as nearly as possible with the bramble-splits which are to be drawn through them. The stitch-holes in the hoop should be filled with putty after the hive is finished.

"Those who wish glass windows in straw hives may accomplish this object by cutting through several of the bands of straw in two places, three or four inches asunder. This is sometimes effected by thrusting two strong wooden skewers through the bands of the hive, a little further apart than the desired width of the windows; these give such firmness to the part as to admit of the cuttings being made with tolerable precision. The windows are generally cut opposite to the entrance, and about the centre; but they may be made at any part of the hive. The ends of the cut straw bands may be secured by pack-thread or softened flexible wire, the panes of glass fastened with putty, and the light excluded by a wooden shutter or a dark curtain."

The situation of the hive is of considerable importance. Indeed, there are certain localities where one will be wise to eschew the keeping of bees altogether; as for instance, near the banks of wide rivers, or by the sea shore; for, on their homeward voyage, like a fleet of richly laden sugar ships, a storm may rise, and they may be driven out to sea, and there be wrecked and drowned. Water, however, is essential to the bees' well doing; it is needful for moistening the pollen on which the young are fed. You are lucky if within a little distance of your house there runs a bright shallow little brook, for on the stepping stones the bees will rest and sip the sparkling liquid to their hearts' content.

The bee-house should not be far removed from your own; without doubt your little winged servants will work all the more cheerfully and at their ease, if they are familiar with your footsteps and voice. I say hear your voice, although it be heretical and against the conviction of many profoundly clever men, who have proved, at least to their own satisfaction, that the bee is deaf; but to adopt this doctrine is to hold as absurd the time honoured custom of "ringing" the bees. It may be a

foolish old country custom, but it is very pleasant to see, and as the principal parties concerned—the bees—are deaf, they at least can take no offence at it. I see no harm in the continued use of the key and the pan at swarming time.

The bees' feeding ground should not be too far from home. No doubt they will travel incredible distances in search of suitable food, but wary in this as in all else, they will never be found with so heavy a load coming from a great distance, as when their pasturage is close at hand. Most flowers cultivated in gardens are good for the bee, as is sanfoin, buck-wheat, and clover. The horse-chestnut and the lime-tree are bound to pay heavy toll to the bee—and should there happen to be in your vicinity a heath or common well covered with furze, the quality of your honey is assured. Poisonous plants, it would seem, yield poisonous honey. Dr. Hosack quotes two cases where the eaters of such honey as nearly as possible died. However, the honey in question was of a darker colour than ordinary, so after all it is very possible that the fault did not lie with the bees at all, but with the rogue who adulterated the contents of the wholesome comb.

The hives when they occupy open ground should each be placed on a separate stand, at least three feet apart. The aspect should be southerly, and they should be protected from rough winds. A good authority on the subject says, "It is not material in what aspect the stock stands, provided the sun shines upon the hive once in the course of the day, as well-peopled hives, kept dry, will thrive in most situations."

If after swarming, the weather should become unfavourable, you must supply your bees with food. Any sugary syrup will answer. It may be placed in a saucer with some chips of wood to serve the bees as rafts to settle on while they feed.

Among the quaint superstitions favoured by the lower order of bee-keepers is one that insists that should a death occur in the family, unless the honey-makers are at once apprised of the circumstance they will pine away and die. Mr. Jesse relates that an old widow once complained to him that all her stock of bees had died, and on inquiring the cause, she informed him that on the death of her husband, a short time before, she had neglected to tap at each of the hives to inform the bees of the melancholy event. Mr. Loudon also mentions that when he was in Bedfordshire he was informed of an old man who sang a psalm in front of some hives which

were not doing well, but which he said would thrive in consequence of that ceremony. This, however, may claim to be considered something more dignified than vulgar superstition; surely to utter a prayer in any tone whatever, is the most efficacious way to amend a dearth of honey or of any other of the world's goods bestowed by the Great Giver. The above-quoted authority likewise mentions a singular custom connected with bee-keeping that came under his notice in Norfolk—that of putting the bees in *mourning* when one of the family dies. A piece of black cloth or crape is attached to each hive, and the good folk thereabout have the most thorough belief that if the ceremony be neglected, the teeming hives will speedily become silent sepulchres.

In acquainting the bees with the death of their master or mistress, the key of the house door is taken by a near relative, and each hive solemnly tapped with it three times, the tapper saying at each stroke, "Bees, bees, master [or mistress] is dead." It seems to be necessary to mention the name of the party, and not to mention the defunct vaguely as "somebody." The practice prevails in certain parts of Kent, and a correspondent writing to me on the subject says that on one occasion he witnessed a "death-telling." The deceased, however, was not absolutely one of the bee-keeper's family, but a little girl who lived in the neighbourhood, and who was almost a constant visitor. There seemed to be some difficulty among the bee-keepers as to whether the bees need be "told" under these circumstances; but it was finally decided that it was "better to be sure than sorry," and so the ceremony was performed, the words used being, "Bees, bees, little Polly, as p'raps you may have seen about here, died to-day at noon."

THE BEE'S NATURAL ENEMIES.

In the year 1707 there was published at the "Seven Stars, Talbot Court, in Gracechurch Street," a volume entitled "England's Interest," written by a very grave and learned gentleman. Part of the said volume is devoted to the management and culture of bees; and though, as a whole, it does not chime in with our modern notions of bee-treatment, still it contains much that is sound and sterling, and not a little that is highly curious. A chapter is devoted to "The Bee's Enemies," and the following extracts therefrom may be worth the perusal as well of the bee-keeper of to-day as of the generation that saw the book newly delivered from the Seven Stars.

"The good bee, as other good people, hath many bad enemies, which she herself cannot overcome without the assistance of man for whom she labours; and therefore the wise bee-man will take care to destroy the enemies of his friend the bee,—whose enemies are—

"1. The mouse (whether he be of the field or house) is a dangerous enemy; for if he gets into the hive he tears down the combs, makes havoc of the honey, and so starves the bees; some gnaw a hole through the top of the hive; some keep their old homes, and come to the hive only for food; and some make their abode between the hackle and the hive. To prevent this, take care that your hives be well and closely wrought; for if the straw be loose and soft, they will the easier make their way through the hive; also take care that your hives be closely daubed with cloom, that they may have entrance nowhere about the skirts, but at the door only. It is also good that ever and anon you take off the hives, not only for this but other causes.

"2. The woodpecker and sparrow are both enemies to the bees; the woodpecker with his long round tongue draweth out the honey; but he doth more mischief to wood bees than those of the garden; the sparrow doth devour the bee from the time of the first breeding till the wheat be kerned.

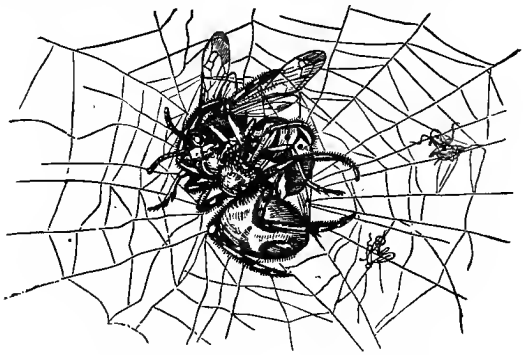
"3. The titmouse is another enemy, of which there are three sorts. The great titmouse, from his black head and breast called a coal mouse, and is the worst enemy to the bees; he always watches at the hive for the coming and going out of the bees; he will stand at the door, and there never leave knocking till one cometh to see who is there, and then suddenly catching her, away he flies with her, and when he hath eaten her, he flies back for more: eight or nine will scarce serve his turn at once. If the door be shut that none can come out, he labours to remove the bar. If that be too heavy, he falls to undermining the door for a new way; and when these devices cannot get them out, some have the skill to break the daubed walls of the hives above, over against the place where they lie, and there they are sure to have their purpose. This is the greatest enemy the bee hath; and therefore by the bee-men of Hampshire he is called the bee-hiter. The little russet titmouse in the winter feedeth only on dead bees; but in the spring he will take part with the great ones. The little green titmouse can only be accused of eating some few dead bees, and that only in some hungry time.

"4. The swallow is another bee-eater, who catcheth the bees

in her chops as she flies, and that not far from the hive when they come laden and weary home. The hornet being much too strong for the bees, is a great devourer of them. Her manner is to fly about the hive till she has spied her prey settled at the door, and then suddenly she taketh it in her feet and flies away with it, as a kite with a chicken. In destroying the hornet you must be wary, for their stinging does oftentimes cause a fever; and less than thirty, as some say, will kill a man.

"5. The wasp is a great enemy to the bees, and more hurtful than the hornet; for the wasps destroy the honey as well as the bees themselves. The best way to destroy them is by killing the mother wasps when they first come abroad; you may take them with your flag at your bee doors on the hives, where they sit sunning themselves, and on the gooseberry bushes from the beginning of May.

"6. The spider is another enemy, which harbours between the hackle and the hive, and you shall seldom find that she hath not two or three bees in store to feed on; and sometimes when the bees are weak they will be bold to enter the hive and there weave their fatal web. Ashes strewed on the outside of the hive will not suffer the spider to harbour there. And thus much for destroying the bee's enemies."



COMBAT BETWEEN WASP AND SPIDER.

THE HUBER BRACELET.

STRUCTURE OF THE BEE.

From the point of its antennæ to the tip of its terrible sting the bee may justly be regarded as one of the most marvellous of God's creatures. To enter at length into a description of the bee's structure would be at least to fill a hundred of these pages, each page abounding with curious facts. To adopt such a course, however, would be to depart from the scheme laid out ere the first page of this volume was written, and give an air of lopsidedness to the work not desirable. All that can be attempted is to take the bee in hand and take brief note of its marvels from head to tail.

Examined through a microscope, its *antennæ*, or feelers, are found to be thread-like appendages, composed of thirteen cylindrical joints of nearly equal diameter, the second from the head being much longer than the rest, and, with the exception of this latter section, studded with fine perforations. As to the true functions of these feelers, as they are commonly called, no physiologist has been able definitely to pronounce. Whether they are organs of hearing, or smell, or touch, or all three combined, the closest and most patient investigation has failed to make perfectly clear. It is known that bees employ their antennæ to ascertain the form of substances, as a guide in their building operations, and as a medium of communication one with the other—the last-named end being accomplished by the bee passing his antennæ across that of his friend.

That great bee-master Huber made some curious experiments to prove the use of these organs. He wished to ascertain whether, when they had lost their queen, they discovered

their loss by smell, touch, or any unknown cause. He first divided a hive by a grate, which kept the two portions about three lines apart, so that they could not come at each other. In that part in which there was no queen the bees were soon in great agitation, and as they did not discover her where she was confined, in a short time they began to construct royal cells, which quieted them. He next separated them by a partition through which they could pass their antennæ, but not their heads. In this case the bees all remained tranquil, neither ceasing their ordinary labour nor troubling to begin a royal cell. The means they used to assure themselves that their queen was near at hand, and to communicate with her, was to pass their antennæ through the openings in the grate. An infinite number of these organs might be seen at once, as it were, inquiring in all directions, and the queen was observed answering these inquiries of her subjects in the most marked manner, for she was always fastened with her feet to the grate crossing her antennæ with those of the inquirers.

Messrs. Kirby and Spence, who record the above experiments of the blind naturalist, furnish another from the same source, showing how essential to the creature's existence these antennæ are. "The amputation of one of the antennæ of a queen bee appears not to affect her perceptibly; but cutting off both these organs produces a very striking derangement of her proceedings. She seems in a species of delirium, and deprived of all her instincts; everything is done at random; yet the respect and homage of the workers towards her, though they are received by her with indifference, continue undiminished. If another in the same condition be put in the hive, the bees do not appear to discover the difference, and treat them both alike; but if a perfect one be introduced, even though fertile, they seize her, keep her in confinement, and treat her very unhandsomely. One may conjecture from this circumstance, that it is by these wonderful organs, the antennæ, that the bees know their own queen."

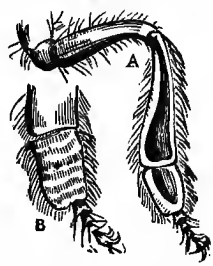
The organs of the bee's mouth are scarcely less wonderful than the antennæ. Its mandibles or jaws, when separated, resemble a pair of toothed pincers; they are composed of the same horny substance as constitutes the rings of the body, and are extremely powerful. Besides these, there are a second pair of jaws (called the maxillæ), composed of two long-pointed blades, whose thin edges work together after the manner of a pair of scissors. It is with these latter instruments that the bee cuts and moulds its wax in its work of cell-making.

The mouth of the bee is further provided with a tongue of a most curious sort. It is capable of protrusion considerably beyond the jaws, and covered along its whole length with regular and symmetrical circlets of fine hairs. From root to tip this tongue is traversed by a tube, through which, in all probability, the nectar is conveyed to the mouth. When, however, the insect is in a state of repose, the whole of this complicated apparatus folds under the head, and to the ignorant beholder its existence would be no more suspected than the ready dart lurking at its other extremity. "Truly," observes Mr. Samuelson, "that although at first sight it may appear strange that so humble an insect should be thus remarkably endowed, it will no longer be a matter of surprise when we come to consider its various occupations. Then, indeed, you will rather be disposed to wonder how simple an apparatus can be made subservient to such a variety of purposes as the gathering of honey, the kneading, cutting, manipulation, and adjustment of wax, the plastering of propolis, the feeding of the young, and many other employments too numerous to be recorded."

The bee's eye is a wondrous construction. Seen through a microscope, and with a few of the hairs removed from the front of the top of the head, the creature seems to possess *three* eyes, disposed so as to form a triangle. In shape the eye resembles one of those elongated leaves of chaff that surround a grain of wheat, and, like the said husks, it has a bright, glazed appearance. Simple as the tiny instrument seems, however, it is composed of the prodigious number of about *three thousand five hundred* perfect hexagonal lenses, fitting closely together and disposed in regular rows. Says the talented author of "Humble Creatures," in his description of the honey-bee, "In order to afford some idea of the general character and operation of one of these compound eyes, we shall compare it to a bundle of telescopes (3,500 remember), so grouped together that the large terminal lenses present an extensive convex surface, whilst, in consequence of the decreasing diameter of the instruments, their narrow ends meet and form a smaller concentric curve. Now, if you can imagine it possible to look through all these telescopes at one glance, obtaining a similar effect to that of the stereoscope, you will be able to form some conception of what is probably the operation of vision in the bee."

The bee has six legs, which serve it, not only for the purposes of locomotion but in various ways connected with its domestic economy. Putting one of its hind legs under a microscope, we

discover it to be composed of six pieces: the first, and that which joins the creature's body, round, like a little ball; the second more egg-shaped; the third long, and tapering to the fourth, which, beginning slight, becomes thick and stout where it joins the fifth division, which is the stoutest part of all, of the same substance throughout, and terminated by a slender finger-like member topped by four claws, which branch from a shallow cup-like organ fringed with hairs. The cup-like apparatus enables the bee to move along upright and overhanging surfaces, as the fly does, and the claws are of great utility in the adjustment of such building-material, &c., as it may be engaged upon. The fourth and fifth joints of the bee's hind leg are so arranged that a hollow exists between, and it is in this hollow that the busy insect stores the "bee-bread" as it gathers it from the flowers.



A.—Hinder Leg of Working Bee magnified and viewed from outside, showing the hollow to contain pollen.
B.—Inside of last joints of ditto, showing the brush-like structure.

The wings of the insect under consideration are not the least curious part of its curious structure. They are four in number, and of a tough membranous texture. Considering the considerable weights the tiny honey-makers have to carry, it is essential that these organs should present to the atmosphere as broad a resisting power as possible. When unladen, and at its ease, the possession of a very broad pair of wings would be but a burden to the creature; and even when she was busy indoors plastering or comb-building, two broad wings, however neatly tucked away, might be found cumbrous. Bountiful Nature has, however, met the difficulty in a manner beautiful as it is simple: on the front edge of the hinder wing are attached a row of tiny hooks, and along the opposite edge of the anterior wing there is a ridge; so that when the insect wishes to spread more sail, as it were, it is merely a matter of hitching the hooks to the ridge, and there are the broad buoyant wings complete.

Nor is this the only purpose to which this wing-splicing is made to apply. With so much business constantly being performed within the hive, with hundreds of little workers labouring as hard as blacksmiths at a forge or bricklayers at a wall, considerable heat is generated. It is not uncommon for us to hear of a dozen wretched tailors or seamstresses sweating in

one little chamber, and in their ignorance sedulously blocking up every chink through which a puff of pure air, or, as they call it, "draught," may come; so their lungs are as ill fed as the rest of their bodies, and they die speedily. The bees are not nearly so stupid as the tailors and seamstresses: instinct tells them that pure air means *life*, and to the best of their limited means they strive for it. Their wings, united the back to the front so as to form a fan, are used as ventilators. The operation of expelling the vitiated air and preserving a cool current through the establishment is thus described by an observant naturalist:—"By means of their marginal hooks they unite each pair of wings into one plane slightly concave; thus acting upon the air by a surface nearly as large as possible, and forming for them a pair of very ample fans, which, in their vibrations, describe an arch of ninety degrees. These vibrations are so rapid as to render the wings almost invisible. During the summer, a certain number of workers—for it is to the workers solely that this office is committed—may always be observed vibrating their wings before the entrance of their hive; and the observant apiarist will find upon examination that a still greater number are engaged within it in the same employment. The station of these ventilators is upon the floor of the hive. They are usually ranged in files that terminate at the entrance; and sometimes, but not constantly, form so many diverging avenues probably to give room for comers and goers to pass. The number of ventilators in action at the same time varies; it seldom much exceeds twenty, and is often more circumscribed. The time also that they devote to this function is longer or shorter, according to circumstances. Some have been observed to continue their vibrations for nearly half an hour without resting, suspending the action for not more than an instant, as it should seem, to take breath. When one retires, another occupies its place; so that in a hive well peopled there is never any interruption of the sound or humming occasioned by this action, by which it may always be known whether it is going on or not."

The abdomen of the bee contains the honey-bag, the stomach the wax-bag, the venom-bag, and the sting. The honey-bag, though sometimes called the first stomach, is not used for the purposes of digestion; it is a small bag, about the size of a pea, with two pouches behind, and is properly only an enlargement of the gullet. This receptacle receives the honey from the proboscis; a small passage leads from thence to the stomach,

which receives and digests the food of the bee. It was formerly supposed that the wax of the bee was the pollen elaborated in the stomach and afterwards ejected by the mouth. Dr. John Hunter, however, discovered two small pouches in the lower part of the abdomen; and it was found that the wax was derived from the saccharine matter consumed by the bee, and that it is secreted from vessels on the surface of these pouches After the wax has remained there for a time, it appears exter nally in scales, eight in number, below the medial rings of the abdomen, and is removed by the bee itself, or one of its fellows

Lastly, we come to the sting of the bee. There can be little doubt that many people are deterred from keeping bees through fear of acquaintance with the potent little spear constantly borne by them. On the principle, however, that he who gathers roses must risk a brush with a thorn, so must he who covets the bee's honey make up his mind to bear the penalty if, once in a while, the thrifty little creature gets provoked to avenge the robbery to the extent of its powers. Besides, as with the rose-bush so with the beehive, you may at first be awkward with your pets, and often give mortal offence when it was your attention to confer a kindness; but, patience and careful observance of a few set rules, and of the temper of your armed *protégés*, you will by-and-by gather the sweets with impunity and without fear of encountering the sours.

The sting of a bee affects people differently. Some will suffer no more pain, and exhibit no more alarming symptoms, than though they had been pricked with a pin; while with others, the sting of a serpent would not produce more frightful results. If their finger be stung, straightway their hand, then their fore-arm, begins to puff and swell, and, finally, the entire limb is brought to double its natural bulk, and the patient, especially if it be the first time that he has been served so, is anything but comfortable. There is, however, little fear of a bee-sting so long as it is external; as, of course, it is in a thousand instances to one where it is not. Bees, however, have ere now been introduced into the mouth through lying concealed in the crevices of ripe fruit, and, in their trepidation, have stung the fruit-eater's throat, so that it has rapidly swollen and stopped his breath.

Butler, who lived and wrote more than a hundred years ago, gives a few quaint hints to bee-keepers, which, though of somewhat coarse texture, and suited to the rough times in which they were penned, are still as applicable as ever:—"If thou

wilt have the favour of thy bees that they sting thee not, thou must avoid some things that offend them; thou must not be unchaste and uncleanly, for impurity and sluttiness (they themselves being most chaste and neat) they utterly abhor; thou must not come amongst them with evil breath, caused by eating of leek, onion, garlick, and the like, or by any other means, the noisomeness whereof is corrected by a cup of beer; thou must not be given to surfeiting or drunkenness; thou must not come puffing and blowing unto them, neither hastily stir among them, nor resolutely defend thyself when they seem to threaten thee, but, softly moving thy hand before thy face, gently put them by; and, lastly, thou must be no stranger unto them. In a word, thou must be chaste, cleanly, sweet, sober, quiet, and familiar; so will they love thee and know thee from all other."

It is a fact to be treasured, that a bee never yet stung any other living thing *wantonly*. He is a sober, peaceful worker, and will never interfere with you if you give him no offence. They are singularly sensitive on certain points: for instance, if you breathe hardly on them, or while you are near them whistle, so that they feel it, they will attack you at once; if you kill one of their kind, they seem to be roused to anger by the smell of the carcase, and swarm about you to avenge the murder. "Never resolutely defend thyself when they seem to threaten thee," writes old Butler; and the better to impress that excellent maxim on the mind of the amateur bee-keeper, and convince him how such a course may help him in the direst strait his bungling may bring him to, I will relate to him a marvellous little story told by Thorley, the bee-master, and furnished by him in his "Female Monarchy:"—

"One of my swarms settling among the close twisted branches of some codling trees, and not to be got into a hive without more help, my maid-servant, hired into the family the Michaelmas before, being in the garden, very officiously offered her assistance so far as to hold the hive while I dislodged the bees, she being little apprehensive of what followed.

"Having never been acquainted with bees, and likewise afraid, she put a linen cloth over her head and shoulders, concluding that would be a sufficient guard, and secure her from their stings. A few of the bees fell into the hive, some upon the ground; but the main body of them upon the cloth which covered her upper garments. No sooner had I taken the hive out of her hands, but, in a terrible fright and surprise, she cried

out: the bees were got under the covering, crowding up towards her breast and face. When I perceived the veil was of no further service, she at last gave me leave to remove it. This done, a most affecting spectacle presented itself to the view of all the company, filling me with the deepest distress and concern, as I thought myself the unhappy instrument of drawing her into so great and imminent hazard of her life, which now so manifestly lay at stake.

"It is not in my power to tell the confusion and distress of mind I was in from the awful apprehension it raised; and her dread and terror in such circumstances may reasonably be supposed to be much more. Every moment she was at the point of retiring with all the bees about her. Vain thought! To escape by flight. She might have left the place indeed, but could not the company; and the remedy would have been much worse than the disease. Had she enraged them, all resistance had been in vain, and nothing less than her life would have atoned for the offence. And now to have had that life (in so much jeopardy) insured, what would I not have given?

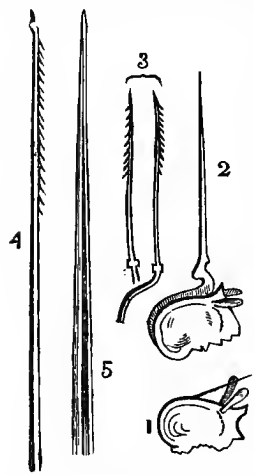
"To prevent, therefore, a flight which must have been attended by so fatal a consequence, I spared not to urge all the arguments I could think of, and use the most affectionate entreaties, begging her with all the earnestness in my power to stand her ground and keep her present posture; in order to which I gave her encouragement to hope in a little space for a full discharge from her disagreeable companions; on the other hand, assuring her she had no other chance for her life. I was, through necessity, constantly reasoning with her, or else beseeching and encouraging her.

"I now began to search among them, now got in a great body upon her breast, about her neck, and up to her chin, for the queen. I presently saw her, and immediately seized her, taking her from among the crowd with some of the commons in company with her, and put them together in the hive. Here I watched her for some time, and as I did not observe that she came out, I conceived an expectation of quickly seeing the whole body quickly abandon their settlement; but, instead of that, I soon observed them, to my great sorrow and surprise, gathering closer together, without the least signal for departing. Upon this I immediately reflected that either there must be another sovereign or that the same was returned. I directly commenced a second search, and, in a short time, with a most

agreeable surprise, found a second or the same: she strove, by entering further into the crowd, to escape me, which I was fully determined against, and apprehending her without any further ceremony or the least apology, I reconducted her with a great number of the populace into the hive. And now the melancholy scene began to change, and gave way to one infinitely more agreeable and pleasant.

"The bees presently missing their queen, began to dislodge, and repair to the hive, crowding into it in multitudes, and in the greatest hurry imaginable; and in the space of two or three minutes, the maid had not a single bee about her, neither had she so much as one sting, a small number of which would have quickly stopped her breath."

And now for a description of the terrible weapon, which, for all that is no thicker than a needle's point, is a terror to grown men. With the exception, perhaps, of its eyes, no part of the bee's anatomy is more curiously beautiful than its sting;—seen through a microscope of low power, it presents the appearance of a tiny thorn slightly curved and tapering to inscrutable fineness. This, however, is not the *actual* sting, but the mere scabbard which contains a distinct pair of darts. To use a clumsy comparison, the sheath is only used as a cobbler uses his awl preparatory to inserting a sewing-bristle in the hole made. Seen under a very powerful microscope, the two darts in question are found to bear eight notches, or barbs, which prevent them from being released too quickly from the part attacked. But the puncture made by this complicated set of instruments is the simplest part of the affair—the terrible dart is poisoned. Situated at the root of the sting there is a little bag filled with an acrid fluid, generally supposed to be formic acid. At the moment when the double dart enters the wound made by the



MAGNIFIED STING OF BEE.

1. Flattened plates on the under-side of abdomen, protecting the sting.
2. The same with the sting thrust out.
3. The blades of the sting more highly magnified.
4. Tip of one blade.
   The sheath holding two blades.

sheath, there is expressed from the poison-bag a drop of the fluid which is conducted in a groove to the end of the sheath, and from thence into the wound. If it is an insect that is so attacked, death speedily follows. If it is a human being that excites the bee's anger, it may employ its sting and inflict considerable pain, but its life is the penalty; it almost invariably happens that the sting is left behind, and without its sting the bee can live but a very few hours.

Various remedies have been suggested for bee-stings; one of the most curious being that of an old bee-master and author of a treatise on bee-management, named Sydserff,—*to cure one bee-wound by the sting of another bee.* At least a dozen of the good man's instances might be quoted from his own treatise in support of this singular doctrine, but the sense of the whole is thus summarized in a single paragraph:—

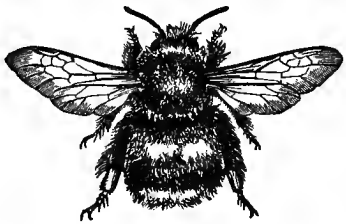
"From hence I take the opportunity of observing that if I am stung by a bee in the face, I generally swell almost blind; if on the back of the hand, the swelling ascends to the tops of my fingers; but if I am stung by two bees near the same place, the swelling is not so much; and if I am stung by ten or more bees, the swelling is very little or none at all. I would not of choice be stung by them if it can be avoided; but after I have been stung once, I have no objection against being stung twice; and after I have been stung twice or three times, I do not mind if I am stung fifty or a hundred times." Even among his immediate friends and helpers, however, Mr. Sydserff failed to make many conversions to his newly-discovered mode, and, writing of a fellow bee-manager, he says, "But though in many respects he is a man of uncommon boldness, and will climb a tree of any height and put his hand in the hole of the tree among the bees the same as into a bird's nest; yet sooner than take my advice, and make use of my infallible, speedy medicine, he will be content to be swollen almost blind, and go blinking like an owl for a week together."

The best-known remedy for a bee-sting is first to pull out the little barb, and then to press over the wound the pipe of a small key: whatever may be left of the sting may be thus squeezed out along with the poison that was injected with it. Whatever pain that remains may be assuaged by the application of a little new honey.

THE HUMBLE-BEE.

With the exception of the hive-bee, the humble-bee is the

only one inhabiting this part of the world that constructs a nest in conjunction with its fellows, and is afterwards content to labour as one of a republic, and for the general good. The colonies of the humble-bee, however, are, as a rule, much smaller than those of the hive-bee, about a hundred of the former being the average of each society They are governed by a queen, and count among them males, females, and neuters.



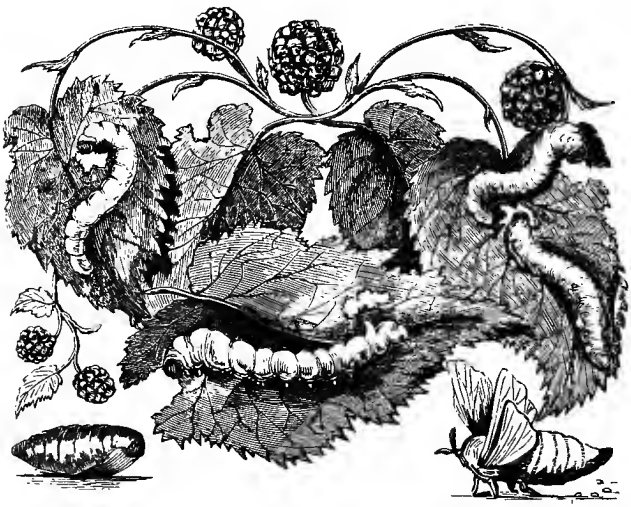
THE HUMBLE BEE.

Towards the close of autumn, and when the cold winds of winter begin to blow, and the honey-yielding flowers die, the male and neuter humble-bees close their lives. Most often the female does not die, but before the intense cold sets in finds a convenient chink,—sometimes in the soft wood of a decayed tree, or in a moss-clump, or among the dead leaves, where she lies in a torpid state, never once stirring to eat or exercise her limbs till the genial warmth of spring rouses her and calls her to new life. Then she begins to found new colonies of her kind, by constructing a nest, and depositing therein the eggs with which she was impregnated before the close of the preceding year.

A grassy bank is generally the site chosen by the mother for the construction of her nest; but sometimes a flat surface is selected, and by one species particularly in a gravelly situation; on this account this particular bee was named by Linnæus *Apis lapidarius*. There are burrowing-bees of this species, and bees that construct a nest on the surface. Concerning the architectural abilities of the burrowing-bee little is positively known. Huber observes: "I have not discovered in what manner they excavate the holes which lead to their nests, nor do I know how they form the vaults in which they are placed; neither am I aware whether they always construct these vaults themselves, or whether they do not sometimes avail themselves of the holes made by moles or other animals." Other authors observe, that although the female bee has been observed to remove particles of earth from a certain spot, as though with the intention of constructing a burrow, she has never been seen to proceed any farther with the business, neither has a partially-

finished bee-burrow been discovered. Reaumer, however, declares that the humble is under obligations to no other animal, or to chance, for her home, but that she is her own digger and delver, using her jaws to dislodge the particles of earth, which are then, by means of the anterior pair of legs, passed backwards to the hinder pair, which perform the same office; and, as the burrow becomes deeper, the whole body is used to eject the grains of soil. The burrow consists of a tortuous gallery, terminated by an arched chamber of considerable dimensions, and in this chamber the nest is fixed. Our knowledge of the behaviour of the bee-mother, all alone and solitary in her dark house, is very limited. According to the most reliable authorities, however, the mother forms a ball of pollen and honey, in which the eggs, numbering from three to thirty, are inclosed. When these eggs are hatched, the larvæ feed on the walls of their prison, the kind mother making good its part as her hungry children eat it thin; and so the process continues until the prisoners grow strong enough to insist on release. When the larvæ are full-grown, each one incloses itself in a silken cocoon of an oval form, and placed always in a perpendicular position. A certain number of neuters, or workers, having undergone their final transformation, the nest is enlarged, and an inner coating of wax is attached to it; and in those nests which are constructed with moss the particles of wax are so amalgamated with it that a portion of the moss cannot be removed without injuring the interior more or less. Wax is also used by the workers in the construction of little cells for the reception of honey. Each species of humble-bee, as Huber informs us, makes these cells in a different manner: some construct them on the top of the cocoon, and of a half-oval form; others build them of an egg-shape, with the apex truncated. In some, again, they resemble the first, but have a ring of wax within the top. The next variety is almost a perfect oval, having but a small opening at the apex.

As an instance of the intelligence of these bees, Huber remarks, that when bees are prevented from obtaining the honey at the bottom of the flower by the tube of the corolla being too narrow and deep, they drill a hole with their proboscis through the calyx and corolla right into the tube, and so tap the vessel containing the golden fluid.



THE SILKWORM.

ACCORDING to Chinese historians, the cultivation of silk was practised four thousand years ago. They assert that two thousand six hundred and ninety-eight years before the Christian era, an emperor, having a dim notion that the silkworm might be turned to commercial account, commanded his wife to devote her attention to the matter. As no doubt it was a matter of life or death to the poor lady, she secretly sought the advice and assistance of the scientific men of the period, and the result was that she was enabled to lay at the feet of her husband the king, the first shred of woven silk the world ever saw. The Chinese historian goes on to say that his majesty was so delighted that he at once raised his wife to the rank of a divinity, under the style and title of the Spirit of the Silkworm and of the Mulberry-tree.

Supposing this story to be true, or founded on truth, it is certain that for many centuries afterwards the manufacture of silks was carried on in a very limited way; for we read of the

Roman emperor Aurelian refusing his empress a silk robe, on the ground of expense; and of Tiberius decreeing that none should wear vestments made from so costly a material. As to the origin of the precious threads, the ancient classic authors were quite in the dark; indeed it was among them the prevailing opinion that the silk grew on trees—an error that probably arose from finding the cocoons suspended from the branches of the mulberry-tree.

In the middle of the sixth century, under the reign of Justinian, two monks brought to Constantinople the eggs of the wonderful insect, together with the tree on which it was nourished. Previously to this, Persia had been the great silk mart; but now Constantinople, under its wise ruler, became its rival, and in a few centuries the silkworm and the mulberry-tree were common throughout Greece.

In the wars of Charles the Eighth, in 1499, in Italy, some gentlemen, seeing the advantages of the commerce of silk, introduced the mulberry into France. The progress of silk-culture in that country, however, must have been very slow, for Henry the Second, who reigned about forty years afterwards, is said to be the first French king who wore silk stockings. Nor was England much more advanced in this branch of commerce than her neighbour; for in the year 1554, in the reign of Mary, an act of parliament was made to restrain the growing vanity of the lower classes of the people. "That whoever shall wear silk in or upon his or her hat, bonnet, or girdle, scabbard, hose, or open-leather, shall be imprisoned during three months, and forfeit ten pounds." James I., while king of Scotland, being anxious to impress the ambassadors sent from England with due reverence, he wrote to his friend the Earl of Mar to borrow a pair of silk stockings, concluding his epistle with the following appeal to the earl:—"For ye would not, sure, that your king should appear like a scrub before strangers." The pompous Henry the Eighth was compelled to wear worsted stockings or none, and his daughter Elizabeth was in so nearly the same predicament, that when her silk-woman brought her a pair of silk stockings, "she was much delighted, and declared she would wear no other sort as long as she lived."

Contrast those "good old times" with the present! Not that they were the worse times for being innocent of silk, or that the present age is particularly benefited in the matter of that which goes to make true gentility, by the universal adop-

tion of the soft and delicate fabric; but as regards our notions of *luxury*, how our things have changed! Yesterday, as it were, King James sends to borrow a pair of silk stockings that he may cut a decent figure before company; and to-day, Betsy Jane, out for a holiday, from the top of her parasol to the hem of her flounces, carries as much of the coveted material as would make half a dozen pairs of hose; and the costermonger, driving along with his cabbage-laden vehicle, carries wisped about his great throat a silken square, richer than the doublet of the great King Henry the Eighth.

Still, although silk has become so common a material, we have not grown wise enough to cultivate it among ourselves. It is neither so cheap an article as to be beneath our consideration, nor an article so difficult of cultivation as to deter us from embarking in it. It is computed that not less than *two millions sterling* finds its way out of the country annually that the demand for silk may be met, and it has been pretty clearly proved that by proper management the greater part of this sum might be kept at home and expended on other articles of English growth, while hundreds of the agricultural population, especially women and children, might be provided with easy and profitable employment.

This, however, is not an essay on political economy, neither do I wish to be regarded as a firebrand by the worthy traders in silk. It would require much more than the half-ounces of silkworms' eggs I deal in to work a revolution. Nevertheless, it can in no way detract from the interest that attaches to the keeping of silkworms as home pets to know that while they afford you much amusement and no little instruction, you are bringing your weight, how little soever it be, against the wedge, the thin end of which is already planted, and which may in course of time open the way to a great trade.

The following directions, culled from such eminent silkworm authorities as Dandolo, Williams, and better perhaps than all, Mrs. Whitley, will, if carefully observed, insure, if not perfect success, at least an amount of satisfaction not always yielded by pets of larger growth.

An ounce of silkworms' eggs represents 40,000 of these interesting creatures; so that the merest fraction of an ounce will be enough for the experimentalist, unless he be very ambitious. There are several dealers in these eggs, but the one recommended by Mrs. Whitley is a Mr. Tagliabue, of Brook Street, Holborn. You will require a spare room, which must

be dry and airy and possess a good space of window and a fireplace. The windows should be provided with calico blinds. You will also want a small portable stove to light in very cold weather and to keep the room dry. Shelves should run all round the room, one over the other, at the distance of twenty-two inches from each other. These shelves may be merely frames, on which coarse netting may be strained, or wicker-work, or of any material through which air can pass; over the net must be laid sheets of thick paper, or lengths of cheap cloth or calico. The best width for the frame-shelves is about two feet two inches; but they may be of any width, according to the size of the room. The netted frames on which the worms are fed should be made to slide into a groove for the greater convenience of feeding the upper and lower tiers. As it is necessary that a steady temperature should be maintained, a thermometer is needful—two thermometers indeed; for it will happen sometimes that one part of a room will be several degrees colder than another.

A plate of salt, or, if you would like to dignify the humble apparatus, you may call it a "hygrometer," is a tolerable substitute for a thermometer. When the hygrometer indicates a very damp state of the atmosphere, or when the salt appears very damp, wood-shavings should be burnt, or straw in the fireplace to absorb the humidity, and replace it by the external air, which is dried by this same blaze. I say blaze, and not fire, for two reasons: the first is, that with two pounds of shavings or of dry straw there can be attracted from all points towards the chimney a large body of air, which issues at the flue of the chimney; while in the mean time, this air is replaced by a similar quantity of exterior air, which spreads over the wicker hurdles or network, and revives the exhausted silkworms. This change of air may take place without effecting any material variation in the degree of heat in the room. If, on the contrary, thick wood were employed, it would require more time to move the interior air, ten times more fuel might be consumed, and the room would be too much heated. The motion of air is, all circumstances being equal, proportionate to the quantity of blaze of the substances that burn quickly. When wood-shavings or dry straw cannot be got, small sticks and light wood may answer.

As soon as the flame rises, the salt shows that the air has become drier, and the degrees of it can be seen distinctly. During the hatching of the eggs, the temperature of the cham-

ber should be at least 64 degrees, and should be gradually increased up to 75 degrees, in which degree of warmth the young worm is to be kept until the first cast takes place. Between the first and second cast the heat should be between 73 degrees and 75 degrees; between 71 degrees and 73 degrees till the third; and lastly, between 68 degrees and 71 degrees till the fourth.

You will want a chopping-board, on which to cut up your mulberry-leaves: they cannot be chopped too fine; because the more the leaf is chopped, the more fresh-cut edges there are to which the young insects fasten themselves. In this manner a few ounces of leaves will present so many edges and sides, that a hundred thousand insects may feed in a very small space. In this state they bite the leaf quickly, and it is consumed before it becomes withered. The leaves should on no account be given wet; it is better to keep the silkworm a day without food than to give it wet. If gathered wet, the leaves should be spread on the floor, and afterwards dried, by a few pounds at a time being shaken in a sheet, which speedily absorbs all moisture.

The time for beginning the hatching the silkworms' eggs is when the buds of the mulberry begin to burst. Place the eggs in shallow card-holes, and cover the top of the boxes with very coarse muslin; spread on the muslin cover young mulberry-leaves finely chopped. Be careful of this; for in the earliest stages of the worm's existence it is unable to bite tough substances. The little worms will, as soon as hatched, crawl through the muslin and feed on the leaves.

Those hatched each day should be removed and placed by themselves, with the date of their birth marked on the tray that contains them. Those first hatched should be placed in the coolest part of the chamber, and those latest hatched in the warmest. This will tend to equalize their growth, and prevent the loss and confusion which result from the worms being of different sizes and casting their skins at different times. The tip of a paper-knife, or something equally handy, should be employed in shifting the worm, together with the leaf to which it is attached, from the lid of the hatching-box to the tray. On no account attempt the removal of the insect with the finger and thumb. As each fresh batch is hatched, place it on a shelf.

From the time the egg is hatched till it becomes a full-grown spinning caterpillar, five weeks elapse, and during that period

the creature undergoes five skin-castings or "moultings." During the first phase of their existence they should be regularly supplied with food. Sprinkle among them every six hours a fresh supply of the minced leaves, taking care that they are perfectly dry; never shift them, or attempt to remove the refuse food until they effect their first "moult." A day or two before this takes place they will become torpid, and appear like small bits of rusty iron wire. As soon, however, as they return to life again and begin to eat, they may be removed to another frame, of larger dimensions than the last.

Follow the directions above given through every stage of the worm's existence, except that, as the older it grows, the less necessity there will be to cut its food so fine, or to select the young leaves from the old.

Ten or twelve days are required to mature them for spinning. During this period they eat voraciously, and their appetite should be indulged; but fresh food should not be given until they have eaten up all the last meal, unless so much has been given as to render the remains dry. By-and-by they will cease to eat, and become of a transparent yellow or pearly white, and wander from their beds to the sides of the frame, holding up their heads as if in search of something on which to rise; then there should be set up, in the form of an arbour, bunches of the seed-stalk of the turnip, after the seed has been beaten out, or dried fennel or heather. It should be spread thinly, in the form of a fan, that the air may not be impeded in passing through the branches, air being essential to the formation of a good cocoon.

At the end of the third day, all the silkworms that have not "risen" must be removed to later frames. At the expiration of ten days, the cocoons may be gathered. Some silkworms will, although fully matured, evince no disposition to *climb*; these must be separated from the rest, and removed to a frame in which are placed a few turnip-stalks, and on these, or under these, they will form as good cocoons as their brethren.

It is good to wind off the fresh cocoons immediately; but if that should not be convenient, it will be necessary to steam them, in order to smother the chrysalis, which would otherwise eat its way through, and destroy the silk. Steaming also gives improved lustre and softness to the silk, and some think it renders the winding more easy, contrary to the old-fashioned way of baking them.

The cocoons should be put into a bag of coarse flannel, or a

basket, and steamed for half an hour over boiling water, exactly in the same manner as potatoes are steamed. When sufficiently steamed, they should be spread on a cloth on the same frames upon which the worms have been fed: these being network, the air passes through, and dries the cocoons; they should be turned and moved occasionally, to prevent fermentation, and should not be heaped upon one another above two inches deep.

The silkworm will eat lettuce-leaves, if given before it has tasted those of the mulberry; but silkworms which are fed on other than mulberry-leaves will degenerate—will not make good cocoons, or strong fine silk, and are subject to diseases from which those are exempt which are properly fed. They will eat any sort of mulberry-leaf, white or red.

THE MULBERRY

PET PONIES A SKETCH FROM NATURE

HORSES FRIGHTENED BY FIRE.

PONIES, DONKEYS, AND GOATS.

THE PONY.

SUPPOSING fairy times to return again, and every boy in the realm to receive a visit from one of the "good folks," with the customary offer to gratify any "three wishes" the said boy chose to express, what would be the result? In some cases, of course, it would be difficult to prognosticate; there would doubtless be boys of what a quaint old writer terms a "bellysome" turn, and who would insist, firstly, on plenty of roast pork; secondly, on unlimited apple dumplings; and thirdly, on a few—no, on a little more crackling. There are soldierly boys who would stipulate for a great army, a great enemy, and a great victory; scholarly boys who would reiterate "books, books, books;" miserly boys (the very worst sort of boys these), with a clamour for "pounds, shillings, and pence;" and boys so

bewildered that they would be driven clean out of their mind, before they could make it up. If, however, I had a turn for wagering (which, thank goodness, I have not), I would wager ten to one that in more than half the cases a pony would be among the most conspicuous of the desires.

It is no wonder that it should be so, when we find sober, elderly gentlemen patronizing equestrian exercise, and delighting in the paces of their fleet nags. What else can be expected than that the boy, brimming over with life and vigour, and utterly incapable of enough physical exertion to tame or tire him, should be never so delighted as when he can set his legs astride a nimble little horse, and enjoy with it the fun of scampering at a pretty rate over the green downs, or making small account of a dozen milestones along the highway.

The genus equus, in whatever shape it may appear, is, however, by no means a modern instance of man's dominion over "the beast of the field." Thousands of years ago ponies delighted boy-riders, and were doubtless ridden with as much skill as at this day is displayed by the most accomplished horseman in Rotten Row. Though, indeed, we need not go back to ancient and barbarous times for a match to modern equestrian skill; there are at the present time a thousand savage riders roaming the North American prairies, able to "give lessons" to the best riding-master in England, and in all probability to teach the renowned horse-breaker, Mr. Rarey, a trick or two. From being constantly on horseback these savage tribes can scarcely walk; from their infancy they are accustomed to it, and among them baby "begins to ride" at much the same period as among us the little thing begins to know what feet were given him for. He grows up literally on horseback, till, becoming a broad-shouldered man, his unused legs are weak and puny and bowed, like those of our old-fashioned postillions. As horsemen, however, they excel all others in the world. "I recollect," says Mr. Darwin, "seeing a Guacho riding a very stubborn horse, who three times reared so excessively high as to fall backward with great violence. The man judged with uncommon coolness the proper moment of slipping off: not an instant before or after the right time. Directly the horse rose, the man jumped on his back, and at last they started at a gallop. The Guacho never appears to exercise any amount of physical force. I was one day watching a good rider, as we were galloping along at a rapid pace, and thought to myself, surely if the horse starts you appear so careless on

your seat you must fall. At this moment an ostrich sprang from its nest right beneath the horse's nose; the young colt bounded on one side like a stag; but as for the man, all that could be said was, that he started and took fright as part of the horse." Another instance of the perfect command the Guacho has over his steed, is to be found in the story of a cattle-owner, who riding home at night was overtaken and attacked by two mounted and armed highway robbers. The two men drew their swords and pursued the cattle-owner. He urged his steed and they theirs, till the two were going at a pace that would have carried off the "blue riband" from any number of Epsom competitors. When, however, the two thieves had nearly overtaken the wily Guacho, he suddenly pulled in his horse and instantly it was still as stone, while the other two, unprepared for the ruse, shot past like lightning; in a moment the cattle-owner set his horse at a gallop, and approaching his attackers, buried his knife in the back of one and mortally stabbed the other. I think, after the narration of these two or three episodes of savage horsemanship, that the reader will agree with me that Rotten Row has no chance against it.

That so noble and invaluable a creature as the horse should be associated with mythological lore, and the superstitious rites and ceremonies pertaining to remote ages, is by no means surprising. Horses were anciently sacrificed to the sun in different nations, their swiftness being supposed to render them an appropriate offering to that luminary. In the religious processions of the sun-worshippers, foremost among whom stood the ancient Persians, horses were largely employed. According to Herodotus, the Scythians sacrificed horses, as well as human beings, to the god of war. The animal was first strangled by the priests, then flayed and cut up, the flesh being broiled on a fire made of the bones. When a Scythian king died, the body was embalmed and laid upon a bed surrounded by spears in a great grave. One of his wives, a groom, a cupbearer, a waiter, a messenger, and several horses were slain and laid in the same grave, together with various vessels of precious metal. The mouth of the pit was then covered, and a high tumulus erected over it. This, however, did not terminate the funeral rites. After mourning a year, his dead majesty's faithful subjects "select such servants as they judge most useful out of the rest of the king's household, which consists only of native Scythians, for the king is never served by men bought with money. These officers, fifty in number, they strangle, and with them fifty beautiful horses. After they have eviscerated the bodies, they fill them with straw, and sew them up. They then lay two planks of a semicircular form upon four pieces of timber (posts) placed at a convenient distance; and when they have erected a sufficient number of these frames, they set the horses upon them, first spitting them with a strong pole through the body to the neck; one semicircle supports the shoulders or chest of the horse, the other his flank, and the legs are suspended in the air. After this they bridle the horses, and, hanging the reins at full length upon posts erected for the purpose, mount one of the fifty young men they have strangled upon each horse, fixing him in his seat by spitting the body up the spine with a straight stick which is received in a socket in the beam that spits the horse. Then they place these horsemen round the timbers and depart." Awfully grand must have been the spectacle of these silent and ghastly sentinels guarding the dead monarch.

So it is throughout ancient history, sacred and profane; and hundreds of instances might be quoted showing the omnipresence of the animal, and how that he always shared in the

adversities and triumphs and in the occupations and amusements of man. Colonel H. Smith states that in the most ancient legislation of India, dating back to a period nearly coeval with Moses, the sacrifice of the horse to one of their deities was enjoined with awful solemnities, and that it was only next in importance to the immolation of a human being. It is recorded of the Emperor C. Caligula, that, possessing a steed of wondrous beauty and speed, he created him a consul, and high priests clothed him in gorgeous trappings worked with pearls, and housed him in a stable, the floor and walls of which were of polished marble, which, by the bye, the honoured quadruped must have found decidedly cold and uncomfortable, and was not for a moment to be compared with the humble but cosy stable enjoyed by the poor greengrocer's colt of modern times.

Even to the present day there exists amongst savage tribes a disposition to regard the horse with superstitious awe. Bruce relates, that whilst journeying through Abyssinia, a potentate named Fasil, having assembled the Galla tribe, said to Bruce, —"Now, before all these men, ask me anything you have at heart, and be it what it may, they know I cannot deny it you." The one great thing the Abyssinian traveller desired was to be shown the source of the river Nile, and this desire he expressed to Fasil. Taking him to the door of the tent the chief showed Bruce a splendid grey horse. "Take this horse," said he, "as a present from me. But do not mount it yourself; drive it before you, saddled and bridled as it is. You are now a Galla. A curse upon them and their children, their corn, and their cattle, if ever they lift their hand against you or yours, or do not defend you to the utmost if attacked by others. No man of Maitsha will touch you when he sees that horse."

The great horse fields of the world are the North and South American prairies. In such tremendous droves do they there abound as to make it worth while to hunt them for their hides and fat and bones, which are shipped to various parts of Europe. A significant proof of the wonderful abundance of horses spread over the plains that stretch from Patagonia to the south-western prairies, is the existence of a written contract wherein a native herdsman agrees to supply a certain Mr. Robinson with twenty thousand horses at the rate of *threepence* each. The horses are hunted with a simple instrument called a lasso, and the business is thus described in the "Wild Sports of the World":—

The "lasso," a simple long noosed cord, is the only weapon used by the Indians in their horse hunts. Armed with this potent implement, and mounted on their savage steeds as naked as themselves, the Indians give chase to the flying herds, yelling as only Indians can yell, and handling the lissom lasso ready for a "cast" as soon as they come up to the wild horses, as after a run of a score of miles or so they invariably do; for—and it is a curious fact—the trained horse, bearing his trainer on his back, possesses greater fleetness and endurance than the wild fellow unbacked and unburthened as he is. The Indians single out a horse from the flying herd, and whirr! flies the unerring cord, the noose making a necklace for the stricken creature, who, so suddenly checked in his thundering career, stands still as a marble horse, while the lasso—its owner having halted his horse the moment the cord was cast—is strained like a thick wire of iron. The skill of both Guachos and Indians in using the lasso is extraordinary. Their faith in it too is unbounded. During the war of independence, eight or ten Guachos, who had never seen a piece of artillery till one was fired at them in the streets of Buenos Ayres, fearlessly galloped up to it, placed their lassos over the carriage of the cannon, and fairly overturned it.

If, however, it was left entirely to the hand of man to thin and keep down these horse-swarms, they would become a plague and both continents would scarce afford them ambling room; where, however, one horse falls by the lasso of the Indian or the Guachos a hundred die the horrid death of thirst at those periods when drought sweeps the land and laps up the pools, leaving nothing but hollows of stagnant mire. Then the horses, tortured to madness, rush into the first marsh or pool they can find, trampling each other to death. Between the years 1827 and 1830 occurred the greatest drought that can be remembered. Brooks were dried up, and the whole country was converted into one vast plain of dust. To own a living well in Buenos Ayres at that time was to own the most precious thing in the world. "I was informed by an eyewitness," says Mr. Darwin, "that the cattle in herds of thousands rushed into the Parana, and being exhausted by hunger were unable to crawl up the muddy banks, and so were drowned. The arm which runs by San Pedro was so full of putrid carcases that the master of a vessel told me the smell rendered it quite impossible to pass that way. Without doubt several hundred thousand thus perished in the river."

The mad career of a troop of wild horses, impelled by thirst, fire, or some other cause of panic, is called a stampedo. While in North America, Mr. Murray witnessed one, and thus describes it: "About an hour after the usual time for securing the horses for the night an indistinct sound arose like the muttering of distant thunder; as it approached it became mixed with the howling of all the dogs in the encampment, and with the shouts and yells of the Indians; in coming nearer it rose high above all these accompaniments and resembled the lashing of a heavy surge upon the beach. On and on it rolled towards us, and partly from my own hearing, partly from the hurried words and actions of the tenants of our lodge, I gathered it must be the fierce and uncontrollable gallop of thousands of panic-stricken horses. As this living torrent drew near I sprang to the front of the tent, seized my favourite riding mare, and, in addition to the hobbles which confined her, twisted the long *lariett* round her fore-legs; then led her immediately in front of the fire, hoping that the excited and maddened flood of horses would divide and pass on each side of it. As the galloping mass drew near our horses began to snort, prick up their ears, and then to tremble; and when it burst upon us they became completely ungovernable with terror. All broke loose and joined their affrighted companions except my mare, which struggled with the fury of a wild beast, and I only retained her by using all my strength and at last throwing her on her side. On went the troops trampling in their headlong speed over skins, dried meals, &c., and overthrowing the tents. They were soon lost in the darkness of the night and in the wilds of the prairie, and nothing more was heard of them save the distant yelping of the curs who continued their ineffectual pursuit.

In no country in the world, however, is the horse so highly prized as in Arabia. There at least it is a "home pet," in the fullest sense of the term. As a foal it roams in and about the tent, eating with the children, playing with them till the playfellows are tired, and all lie down together, he with the four legs serving as a pillow for the rest. He is christened, and should he stray a quarter of a mile from home, hears his name, and answers with a neigh should one of the youngsters bawl for him from the tent-door. He is regarded as a child by his master, and is never called on to do an hour's work till the anniversary of his second birth-day. Once broke to the saddle, however, it is seldom off its back. "Summer and winter it spends the hours of daylight in the open air, either journey-

ing or picketed to a tent-pin, and at night it is called into the tent, and lies down with its master, neither feared nor fearing."

The most celebrated of Arab horses are called Kohlâne, and are said to descend from the mare habitually ridden by the Prophet. At the time these horses are broken to the saddle their pedigree is carefully written on parchment, encased in a little bag, and hung round the creature's neck. The following, extracted from the *Court Journal*, is a verbatim copy of such a pedigree:—"This horse, the sire of Rabbamy, equal in power to his son, is of the tribe of Zazzalah, and descends from the uncle of Lahadah the sire of Alkeb, is of a fine figure and fleet as an ostrich. Herewith is his tooth when a colt in a bag with his pedigree, which a Caffre might believe. Among the honours of relationship he reckons Zaluah, the sire of Nahab, who was the sire of Kallak and the unique Alkeb, sire of Manassah, sire of Alsheh, from generation to generation, down from the noble horse Lahalala. And upon him be green herbage in abundance and the waters of life, with an edifice enclosed with walls, a reward from the tribe of Zoab for the fire of his race; and let a thousand cypresses shade his body from the hyæna of the tombs, from the wolf and the serpent of the plain; within the enclosure a festival shall be kept, and at sunrise thousands shall come and observers arrive in troops, whilst the tribe exhibits under a canopy of celestial signs the saddle and the name and the place of the tribe of Beb Altabek in Mesopotamia, and Kulasla of Lutarev, of the inspired tribe of Zoab. Then shall they strike with a loud noise, and ask of Heaven in solemn prayer immunity for the tribe from evil and the demon of languor, from pestilence, from wandering from God, from scabby camels, from scarcity, from perplexed congregations, from the spleen, from the fiery dragon, from commixation, from beating on the feet, from treading out with the feet, from Heinban, or the unknown son of an unknown father, from lameness at birth, from imposthumes, from seclusions and from fascination, from depression and elevation, from cracks in the feet, from numerous assemblies, from importunate soothsayers, from the offspring of prophets and nocturnal travellers, from diviners of good opportunity for a purpose, from relations and degrees of affinity, and from rash and inordinate riders, deliver this tribe, O Lord, and secure those who are slow to follow and slow to advance, who guard the truth and observe it."

The feats of speed and endurance these intensely domesticated animals will perform is wonderful. Fifty miles, without a moment's halt, is by no means an uncommon journey for an Arab horse of the true breed to perform; indeed, Colonel Smith relates, that a Mr. Frazer rode from Shiraz to Teheran, a distance of five hundred and twenty-two miles, remained three to rest, went back in five days, remained nine days at Shiraz, and returned again to Teheran in seven days.

According to the Desert code of morals, horse-stealing is looked upon as an honourable proceeding, if the sufferer be a stranger or a man of another tribe. To rob a hostile tribe is considered a laudable achievement, and the thief is honoured by his comrades according to the skill and daring employed during the pilfer, rather than to the amount of booty acquired. One of the best stories of Arab horse-stealing is as follows:—

A Bedouin, named Jabal, possessed a mare of great celebrity. Hassad Pasha, then governor of Damascus, wished to buy the animal, and repeatedly made the owner the most liberal offer, which Tabal steadily refused. The pasha then had recourse to threats, but with no better success. At length, one Gafer, a Bedouin of another tribe, presented himself to the pasha, and asked, what would he give to the man who should make him master of Jabal's mare. "I will fill his horse's nosebag with gold," replied Hassad. The result of this interview having got wind, Jabal became more watchful than ever, and always secured his mare at night with an iron chain, one end of which was fastened round her hind fetlock, whilst the other, after passing through the tent-cloth, was attached to the picket driven into the ground under the felt that served himself and his wife for a bed. But one midnight, Gafer crept into the tent, and insinuating his body between Jabal and his wife, he pressed gently, now against the one, and now against the other, so that the sleepers made room for him right and left, neither of them doubting that the pressure came from the other. This being done, Gafer slit the felt with a sharp knife, drew out the picket, loosed the mare, and sprang on her back. Just before starting, he caught up Jabal's lance, and poking him with the butt-end, cried out, "I am Gafer—I have stolen your noble mare. I give you notice in time." This warning was in accordance with the usual practice of the Desert on such occasions. Poor Jabal, when he heard the words, rushed out of the tent and gave the alarm, then mounting his brother's mare, and accom-

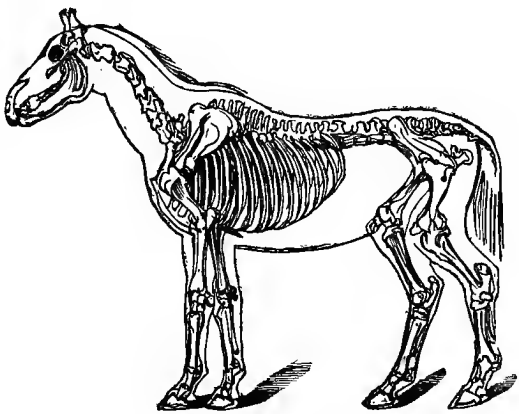
panied by some of the tribe, he pursued the robber for four hours. The brother's mare was of the same stock as Jabal's, but was not equal to her; nevertheless, she outstripped those of all the other pursuers, and was even on the point of overtaking the robber, when Jabal shouted to him, "Pinch her right ear, and give her a touch of the heel!" Gafer did so, and away went the mare like lightning, speedily rendering further pursuit hopeless. The pinch in the ear and the touch with the heel were the secret signs by which Jabal had been used to urge the mare to her topmost speed. Every Bedouin trains the animal he rides to obey some such sign, to which he has recourse only on urgent occasions, and which he makes a close secret, not to be divulged even to his son. Jabal's comrades were amazed and indignant at his strange conduct. "Oh! thou father of a jackass," they cried, "thou hast helped the thief to rob thee of thy jewel." But he silenced their upbraiding by saying, "I would rather lose her than sully her reputation. Would you have me suffer it to be said among the tribes that another mare had proved fleeter than mine? I have at least this comfort left me, that I can say that she never met with her match."

The following hints as to what should be the proper conformation of horses, little and big, may be useful to the reader in the event of his meditating a purchase.

The head should be small, or at all events rather small than large in proportion to the animal's size, and well "set on;" that is, the lower jawbones should be sufficiently wide apart to enable the head to form that angle with the neck which gives free motion and graceful carriage to it, and prevents its bearing too heavily on the hand. The eye should be large and rather prominent, and the eyelids fine and thin. The ear should be small and erect, and quick in motion. The lop-ear indicates dulness or stubbornness; and when it is habitually laid too far back upon the neck, there is too frequently a disposition to mischief. The nostrils should be capacious. The neck long rather than short. It then enables the animal to graze with more ease, and to throw his weight more forward whether he is in harness or galloping at the top of his speed. It should be muscular at its base, and gradually become fine as it approaches the head. The withers should be high. The shoulder should take a slanting direction, as affording an easy and pleasant action and a greater degree of safety. The chest must be capacious, for it contains the heart and the lungs,

the organs on which the speed and endurance of the animal depend. The loins should be broad, the quarters long, the thighs muscular, and the hocks well bent and well under the horse.

The age of the animal should be known by its teeth. I am aware that such an assertion is likely to provoke a grin on the part of roguish horse-cobblers, who more successfully practise their dishonest tricks on the horse's mouth, than on any other part of the poor beast; but it is very possible, by careful and quiet examination, to ascertain the true state of the case, in spite of the magic and conjuration of every horse-rascal in London.



SKELETON OF THE HORSE.

When the colt is born, in most cases the first and second molar and grinding teeth will appear above the gums. In the course of a week or so his front incisor teeth will show—two above and two below. In about six weeks the next two incisors may be seen, and so on will the colt's teeth increase in regular order, till at the age of eight months it will possess its full complement of front or cutting teeth. These teeth have an elevated cutting edge of considerable sharpness, and formed of a substance so hard that a steel file will make no impression on it. The sharp ridge is bent somewhat inwards and over the tooth, so that there is a depression behind it, which gra-

dually becomes stained by the food, and constitutes what is called the "marks" in the month of the colt or horse. This elevated ridge of enamel, hard as it is, however, is gradually worn down in the act of nipping and cutting the grass, and as it wears away, the hollow behind becomes diminished and is at length totally obliterated. By the degree in which this mark is effaced, may be judged the age of the colt at this early stage of its existence. If the animal has reached the age of a year and a half, the mark will be very faint on the central nippers, diminished in the other two, and the surface of all the teeth will be flattened.

As the horse approaches the age of three years it sheds its central milk teeth, and they are replaced by two others of much larger size. At this period of the creature's life the horse-cheat steps in. A three-year-old colt will fetch considerably more than a two-year-old; and there is no certain guide to its age but the teeth, so the cheat extracts the central milk teeth many months before they would be shed, and having now nothing to impede their progress, the larger teeth grow up and the purchaser is swindled. Nor is the fraud easily detected, except by the comparative newness of the nippers that remain, and by the general deficiency of development exhibited by the colt.

At three years old, the new central teeth, although broader than the rest, are not so high; the mark in the next pair is nearly worn away, and the corner nippers show signs of wear. At the age of three years and a half, the second nippers are pushed out to make room for new teeth; and a twelvemonth after, the corner nippers undergo the same process. Thus the purchaser of a four-year-old pony or horse will find the two front teeth fully grown, the next pair rather more than half grown, and the corner nippers still very small, with the mark nearly effaced. Six months later, in addition to these teeth, the "tushes" will have made their appearance. The use of these to the domesticated horse does not appear, although, in a wild condition, it is likely that the horse finds them extremely serviceable. The tushes spring from between the nippers and the grinders. Another year added to the horse's life, and the mark on the central nippers is almost, if not entirely, obliterated. A brownish hue may mark its surface, but the black centre spot has vanished.

The animal may now be considered in the prime of its existence. It is never so handsome, so strong, so valuable, as

now. The cunning horse-cheat well knows this; and should an animal come into his hands with undoubted symptoms of having topped the hill of life, or, rather, that has gone a year or so down what is generally considered the wrong side of it, it is the cheat's business to conceal this fact, and he will no more admit that a horse of his is more than "rising six years," than certain maiden ladies will ever confess to be more than "twenty-seven." The horse-cheat, however, proceeds to lengths to give colour to his mistatement that would without doubt daunt the most strong-minded spinster in England. The horse's teeth are the tell-tales, so they must be made to tell a false tale. A black mark on the surface of the tooth denotes that the animal has barely reached its sixth year, therefore the seven or eight year old horse is cast, and with a sharp-pointed steel instrument a little hole is dug on the surface of the corner incisor, to which a red-hot iron is afterwards applied. An indelible black mark is thus left on the tooth. Sometimes the roguery is carried further: the next tooth is slightly touched with the engraver and the cautery; but here the dishonest dealer generally overreaches himself, for the form and general appearance of a six-year-old horse can rarely be given to one who has passed his eighth year: that is to say, such a cheat would not pass with a person whose business it is to study the shape and make of a horse. I am afraid, however, that you or I, reader, would find it a difficult matter to detect the fraud. For my part, if it is ever my good fortune to afford to keep a horse, or even a pony, I shall prefer to place the purchase-money, with the little fee over, in the hands of a respectable veterinary surgeon; and, unless the reader is either very knowing or very obstinate, he will do well to follow the same plan.

Not, be it borne in mind, that a horse is useless for all ordinary purposes when he has reached his tenth or twelfth year. If he has been well kept he may have twenty good years of life in him—in the hands of a good master he has been known to attain the ripe age of forty years. This, however, is not the animal that exists chiefly on chaff and draws a sand-cart, or the unlucky brute who has the advantage of the invigorating air of Blackheath to set against the drawbacks of a continuously yearning belly and ten hours a day up-hill fagging bestrode by cockney equestrians.

With regard to the general management of the pony, it may be fairly assumed that in all matters pertaining to harnessing, bedding, cleaning, &c., &c., the lad in whose care he is placed

will be fully competent. The etceteras, however, cannot be so confidently extended to the animal's eating and drinking. This the owner had better look to himself, at least till his groom is made thoroughly to understand his master's wishes on the subject.

In the best-regulated stables the watering of the horse is often seriously mismanaged:—As, says a reliable authority, "the *kind* of water is not sufficiently considered. The difference between hard and soft water is a circumstance of general observation. The former contains saline principles which decompose some bodies, as in the curdling of soap; and prevent solution of others, as in the making of tea, the boiling of vegetables, and the process of brewing. It is natural to suppose that the different kinds of water would produce somewhat different effects on the animal frame; and such is the fact. Hard water, freshly drawn from the well, will frequently roughen the coat of a horse unaccustomed to it, or cause griping pains, or materially lessen the animal's power of exertion. The racing and hunting groom is perfectly aware of this; and so is the horse, for he will refuse the purest water from the well if he can obtain access to the running stream, or even the turbid pool. Where there is the power of choice, the softer water should undoubtedly be preferred. The temperature of the water is, however, of far more consequence than its hardness. It will rarely harm if it drinks from the pond or the running stream; but its coldness when recently drawn from the well is often injurious. It has produced colic, spasm, and even death. If, therefore, no better can be had, it should be exposed for some hours either in the stable or in some tanks."

The animal should not be irregularly supplied with water. When it is at rest in the stable the quantity of water it will consume may pretty safely be left to the animal itself; under such an arrangement it will be found to consume less than if allowed to grow very thirsty and then to take a "full swig." In this latter case it behaves with no less prudence than distinguishes the conduct of a parched and thirsty man—it drinks much more than is good for it.

Before going a journey the pony may be allowed half a gallon of water, and he will certainly travel none the worse for it. At the end of the journey, or at the "bait" that breaks it, it is a good plan to give him a *little* water before his corn is offered to him, and a little more in the middle of the meal.

He is naturally an herbivorous animal. His thin and muscular lips, his firm and compressed mouth, and his sharp incisor teeth, are admirably adapted to seize and crop the grass; and, although we know nothing of him in his natural state, yet when he has escaped the bondage of man and follows his own propensities, grass is his chosen food. In his domesticated state, however, he was destined to live partially or chiefly on other aliment, and that of a much harder kind—the various species of corn; therefore, while man and the carnivorous animals can only champ and crush their food, a provision is given to the horse, in the structure of some of the bones of his face, by which he can comminute and grind down his food as perfectly as in the best-contrived mill. Therefore there is no necessity to crush oats or beans before they are offered to the animal. Let it be borne in mind that in the beautiful working of nature's laws, although to keep the body healthful constant exercise of its various members is essential, yet in every case is this exercise more or less pleasurable; so that in saving a horse the trouble of grinding the corn he eats, we may be wantonly lessening the pleasure a meal should afford him. As to the new-fangled "horse-food," the best that can be said, that in one case out of five it may be as good—it cannot be better—than the old-fashioned food, oats and hay. This should be its food during the winter months, with, perhaps, a little chaff thrown in by way of amusement; in the summer, green food must be substituted for hay. As to the quantity of food to be given to a horse or pony, that must be regulated by the creature's appetite. In this respect horses are like men: some will look, and really be, hungry after consuming twice as much as will amply satisfy others.

It will very much conduce to the pony's comfort, and to the good understanding that should exist between you, if you study to treat him like what he really is—an animal of comparatively high intellect. Treat him like a drone and a dolt, convey your simplest orders at the end of the whip-thong, substitute a painful "sawing" of his mouth for a gentle word, and he will very justly set all the brutality in his nature against yours, and earn the character of a vixen: but treat him as you would a pet dog, talk to him (horses love to be talked to), if you are not of too grave a turn, *play* with him now and then, and when he seems particularly inclined for a game. You will find this course not only the most pleasant, but by far the most economical: he will cost you nothing for physic;

he will live many years longer; one pair of reins will last twice as long as under the other system; and the whip, in its niche in the harness-room, will need cleaning to save it from mildew. Indeed, as says the author of "Animal Life," "the bridle may be reduced to a mere form, as the touch of a finger or the tone of a voice is sufficient to direct the animal. The infliction of pain is a clumsy and barbarous manner of guiding a horse; and we shall never reap the full value of the animal until we have learned to respect its feelings, and to shun the infliction of torture as a brutal and cowardly act. To maltreat a child is always held to be an unmanly act; and it is equally cowardly and unworthy of the human character to maltreat a poor animal, which has no possibility of revenge, no hope of redress, and no words to make its wrongs known. Pain is pain, whether inflicted on man or beast, and we are equally responsible in either case."

Ponies, as well as horses of larger growth, are at times given to *shying*. This disagreeable habit arises from various causes, chief among which is too much oats and beans, and too little work. Lean and hard-worked ponies are never guilty of the affectation. Whoever saw a cab-horse evince anything like nervousness at an uncommon spectacle, except, indeed, it be that of a full-laden hay-wagon, and then the emotion displayed by the poor brute is certainly more in the nature of eagerness to get at it than of fright at its appearance. The lazy, heavily-fed animal is, on the contrary, as observes a modern writer, "like the hair-trigger of a rifle, prepared on the shortest touch to cause a very violent explosion. In fact, without metaphor, on the slightest occurrence he is not only ready but exceedingly desirous to jump for joy. The *casus belli* which the animal would, perhaps, most enjoy, would be to meet a temperance, runaway, awning-covered wagon in hysterics all screaming; or to have a house fall down just as he was passing it. However, as a great conqueror, if he cannot discover a large excuse for invading the territories of his neighbours, he is sure to pick out a very little one; so does the high-mettled horse, who has nothing to start at, proceed under his rider with his eyes searching in all directions for something which he may pretend to be afraid of. Influenced by these explosive propensities, he cocks his ear at a large leaf, which the air had gently roused from its sleep, as if it were a crouching tiger; and shortly afterwards a fore-leg drops under him as suddenly as if it had been carried away by a

cannon-shot, because in the hedge beside him a wren has just hopped from one twig to another, nearly an inch."

There are, however, no good grounds for the insinuation conveyed in the above paragraph, that shying is a mere wanton freak, and indulged in by the animal as an amusement to beguile the tedium of a journey. It is no uncommon thing for horses to do themselves painful and serious injuries in these sudden paroxysms of fear; and though the brute kind have been known to find pleasure in inflicting pain on others, there are few recorded instances of an animal hurting itself for the fun of the thing. Besides, any one ever astride a nervous quadruped can answer for the involuntary thrill that stirs the creature's frame when alarmed by suddenly encountering an object it cannot understand.

But what is the course usually adopted by the rider of a shy quadruped? It sees a white post, a heap of stones, or a scrap of laundry work bleaching on a hedge, and its distorted vision makes of it something more monstrous perhaps than we have any conception. It starts back to avoid the monster, and is anxious to go in any direction but that where it lies. To parley over such a ridiculous matter with a senseless horse is unbecoming the reasoning being on its back, so the reasoning being lashes his beast or goads it with his spurs, and after a struggle more or less severe the poor animal is compelled to pass the terrible object; once past it, it no longer objects to the road before it; on the contrary, it is only too eager to put a long distance between itself and the dreadful thing that frightened it. But is it cured of shying?—will it not, should it come again along that road, even a month afterwards, look out nervously for the hobgoblin that so alarmed it, and—if it be a sensible brute it has a perfect right to infer—so alarmed *you*, or why all the fume and fuss and flogging?

Various cures for the unpleasant propensity have been recommended, but the most feasible is that of Sir F. B. Head.

"The effective cure for all these symptoms of exuberant pent-up spirits, is a long steady hand-gallop up and down hill across rather deep country. Before, however, this opportunity offers, man can offer to the brute beneath him a more reasonable remedy. The instant that a horse sees, at a short distance before him, say a heap of stones, at which he pretends to be, or really is, afraid, instead of forcing him on he should be allowed, or, if it be necessary, forced to stop, not only till he has ceased to fear it, but until, dead tired of looking at it, he

averts his eyes elsewhere. While advancing towards it, so often as his fear breaks out, by instantly bringing him to a stand-still, it should be appeased anew.

"In slowly passing any object which a horse appears to be afraid of, the error which is almost invariably committed is to turn his head towards it, in which case, revolving upon his bit as on a pivot, the animal turns his hind quarters from it, and in that position with great ease shies more or less away from it; whereas, if the rein opposite to it be pulled firmly, he not only instantly ascertains that his rider's desire is in opposition to it, instead of in favour of forcing him towards the object of his fear, but when his head is drawn away from it, although he is able to rush forwards, it is out of his power to shy laterally."

The same authority furnishes the equestrian world with a few valuable hints as to what should be its conduct should it by accident or design find itself "out of its depth" in a brook or river:—"In riding into deep water, the animal just before he floats appears to step rather uneasily, as though on legs of different lengths; but the instant his feet take leave of the ground, or if at once he plunges out of his depth from a bank, as soon as his head comes up he proceeds as free from jolts of any sort as a balloon in the air, grunting and groaning, nevertheless, heavily, at the injustice of having a man's weight superadded to its own, the specific gravity of which but little exceeds that of the element into which he is striving not to sink. Instinctively, however, adjusting himself to the most favourable position, which throws the hind part of his body about a foot under water, he makes the best of a bad bargain, and then all the rider has to do is not to destroy the poor animal's equilibrium by pulling even an ounce at the bridle. Indeed, in crossing a broad stream the most effectual way to prevent overbalancing him, and also to stop his grunting, is either to slip sideways from his back, and then half swimming to be dragged alongside by him by a lock of his mane firmly entwined among the fingers of the right hand; or, as invariably practised by the Red Indians, to be towed by his tail, in which case the man floating on the surface of the water is quite safe from the heels of the horse struggling many feet below him. By this plan the water instead of the horse sustains the human weight.

"Four-fifths of the art depends on attaining a *just* seat, and one-fifth in possessing a pair of light hands. But, although

the attainment of these advantages is not incompatible with an easy erect position on horseback, the generality of riders are but too apt to sit on their horses in the bent attitude of the last paroxysm of exertion which helped them into the saddle. Now when a man in this toad-like position rides along—say a macadamized road—he travels always ready at a moment's notice to proceed by himself in the direction in which he is pointing, in case the progress of his horse should be suddenly stopped by his falling down. Indeed, when a horse without falling down recovers by a violent struggle from a bad trip, a heavy rider in this attitude is very likely to shoot forwards over his head. . . . On the other hand, when a man sits upright, justly balanced in his saddle, any sudden jerk or movement forwards throws his shoulder backwards. If, therefore, while proceeding in that position, the horse thinks proper to fall, the animal in the first instance is the sole sufferer. He cuts his forehead, hurts his nose, breaks his knees, bruises his chest, while his head, neck, fore legs, and the fore part of his body, forced into each other like the joints of a telescope, form a buffer preventing the concussion the horse has received from injuring in the smallest degree the rider, or even the watch in his pocket.

"If a horse be properly dealt with he can gallop down a turf hill with nearly as much rapidity as along a race-course. A tea-table would stand ill at ease on the declivity, because its limbs are immovable; but a quadruped, by throwing all his legs forwards, and his body backwards, has the power to adjust himself with mathematical precision to almost any descent. To ensure his safety, however, it is essential that he should be encouraged by a loose rein to carry his head as low as possible, to enable him to take care of his feet, and in case of treading on a rolling stone to recover his balance by throwing it up. Now, when in this position, if the rider, following the instinct and example of the horse, throws his weight backwards—in fact, if from the saddle the backs of the two animals are separated from each other by only a very small angle, both can descend the hill together at considerable speed, and without the smallest danger. The only embarrassment the rider has to contend against is an over-caution on the part of the horse, amounting to fear, which induces him to try to take the slope diagonally, very likely to result in the poor animal slipping up on his side. In keeping his head straight, however, care must be taken not to induce him to raise it up; and when this little difficulty is

overcome, no other of any sort or kind remains to impede a rapid and safe descent."

The action of the horse's legs is now generally understood; the common error being that, in walking, the animal moves both the legs on the same side. The delusion arises in this way. Suppose the horse to start a walk by putting forward its *left* hind leg. This having been advanced and placed on the ground, the *right* fore leg is next raised and advanced, then the *right* hind leg, and lastly the *left* fore leg follows, so that in passing a horse the two legs appear to move together on the same side. In trotting, the horse moves his legs diagonally; while in galloping it adopts three different modes of locomotion. In the canter its four legs reach the ground in succession—the left hind foot first, then the right hind foot, then the left fore, and lastly the right fore. In what is known as the gallop of "three beasts," the horse moves first the right and left hind leg, the right hind leg and the left fore leg follow next, the right fore leg moving last. In leaping, the horse raises the fore legs from the ground, and projects the body upward and forward by the hind legs alone.

WILD HORSES AND WILD RIDERS.

THE DONKEY.

For so long a period has this patient and hard-working animal been domesticated among us, that its original progenitors seem to have become quite extinct. There are at the present time animals known as "wild" asses, and "wild" enough they are, in the ordinary sense of the term; but in almost all such cases they are the descendants of domesticated creatures which have escaped from captivity, or mules of the wild and domestic ass. The wild ass is found both in mountainous districts and in plains; vast troops roam over the great Asiatic deserts, migrating according to the season,—in summer, as far northward as the Ural; in winter, southward to the borders of India. It has a short mane, of dark woolly hair; and a stripe of dark bushy hair runs along the ridge of the back from the mane to the tail. It has longer legs, and carries its head higher, than the domestic ass. It associates in herds, and, like the horse, has a leader. In Persia it is one of the chief objects of the chase, and when hunted down it is eaten, its flesh being considered as great a dainty as is venison among us. It is, however, by no means easy to hunt down. Strange as it may seem to us who have seen the ass in no other guise than a forlorn drudge, as a free animal it is graceful in shape as the antelope, nimble as the Bavarian chamois, and fleeter than the lithe-limbed Arabian steed. So it is, however; and out of at least twenty recorded instances testifying to the above facts, the following, given by Sir Thomas Ker Porter, will serve:—"My greyhound suddenly started off in pursuit of an animal, which my Persians said, from the glimpse they had of it, was an antelope. I instantly set spurs to my horse, and with my attendants gave chase. After an unrelaxed gallop of full three miles we came upon the dog, who was then within a short stretch of the creature he pursued, and to my surprise, and at first vexation, I saw it to be an ass. Upon a moment's reflection, however, judging from its fleetness that it must be a wild one,—a creature little known in Europe, but which the Persians prize as an object of the chase,—I determined on approaching it, as closely as the very swift Arab on which I was mounted would carry me; but the single instant of checking my horse to consider, had given our game such a head of us that, notwithstanding all our speed, we could not recover our ground on him. I, however, happened to be considerably before my companions, when, at a certain distance, the animal, in its

turn, made a pause, and allowed me to approach within pistol-shot of him. He then darted off again with the quickness of thought, capering, kicking, and sporting in his flight, as if he were not blown in the least and the chase were his pastime. When my Persian followers came up they regretted that I had not shot the creature when he was within my aim, telling me that his flesh was regarded in Persia as a great delicacy. The prodigious swiftness and peculiar manner in which he fled across the plain above all reminded me of the striking portrait drawn by the author of the Book of Job."

"There is a vulgar notion," writes the author of "Wild Sports," "that no such thing as a wild ass ever existed;" and, in my opinion, if vulgar disbelief ever deserved excuse, it does in this instance. It is easy enough to imagine a wild horse, or bull, or dog, or cat, or rabbit; but take the ass, the humble donkey, with which we are all familiar. Regard him as he broods along moodily, slowly hungling over the cobble-stones, oppressed by the weight of a pyramid of cabbages and several sieves of potatoes, the property of the costermonger his master. Watch his eye when the heavy old whip-stock is brought down with the force of a Fijian war-club across his hollow flanks: he does not even blink,—or if he does, it is not the sudden wink of pain, but a deliberate and contemptuous closing of his optics, expressive of his utter indifference to any amount of whip-stock that may be applied. See him even at liberty out on the common. Does he frisk about and gambol in the sun, as does even the sand-carter's worn-out Flemish mare? No; he moves about as though the wheels were still at his heels, and crops the grass laboriously; or turns his tail to the wind, and for an hour stands stock-still, as though waiting for the "Kim up," the magic words by which his life is regulated.

Nothing can be more erroneous than to regard the donkey as a stupid animal. Truly, at times it exhibits extreme obstinacy; but that is only when it is greatly ill-used—when for its best services and its willing speed it gets no other reward than stripes and bruises; so far from taking his obstinacy, under such circumstances, as a proof of his obtuseness of intellect, it may, with at least as much justice, be attributed to an uncommon amount of intelligence, equal to the task of weighing this matter against that and deducting a sensible conclusion. "If I do my best," the donkey might argue, "if I resolve in the morning to go about my day's work cheerfully, and to show in what capital spirits I am, cut a brisk caper in the shafts of the

barrow, or utter a musical bray, I am rewarded with a whack on the ribs, in the first case, for being vicious, and in the second—the ignorant brute that my master is—for *calling down rain* with the malicious intention of spoiling his day's trading. As we bowl along to market, if I put my best leg foremost, thinking thus to please him, he directly lays into my sides might and main, that his fellow donkey-drivers on the road may think, that, tidy as my present pace is, it is nothing to what I can do if I like, and it is because I don't like that he is flogging me. If I run as fast as I can I am thrashed; if I saunter I am thrashed; therefore, as it is easier to saunter than to run, let him whack his hardest while I saunter."

Dozens of stories might be told of the ass's sagacity. What does the reader think of the following (related by the Rev. J. G. Wood) as the performance of a "silly" creature? A number of rabbits were kept in a little outhouse, and inhabited a set of hutches fastened to the wall. One day it was found that all the store of oats had suddenly vanished from the outhouse without any visible reason. Next morning, however, the donkey, who lived in an adjoining meadow, was seen to open the gate which led into his field, and cautiously shut it after him. This conduct afforded a clue to the disappearance of the oats; and, upon a careful search being made, his footmarks were traced along the path to the rabbit-house, and even along the ground among the hutches. It was very clear that the ingenious animal must have unlatched his own gate, unfastened the hasp of the rabbit-house, finished all the oats, and have returned as he went, refastening all the doors behind him. In leaving the rabbit-house he must have backed out, as the place was not wide enough to permit him to turn.

Another donkey, belonging to one of Mr. Wood's friends, was permitted to walk at large in the garden, on condition that he restrained himself from leaving the regular paths. Once or twice he had been seduced by the charms of some plant to walk upon the flower-beds, and had been accordingly drubbed by the gardener, who detected the robber by the marks of his footsteps, which were deeply imprinted in the soft mould. After a while the animal seemed to have reflected upon the circumstance which led to the discovery of his offence, and the next time that he walked upon the flower-beds he scraped the earth over his footmarks, and endeavoured to obliterate the traces of his disobedience.

In Eastern countries the ass was always much more com-

monly used than among us, and continues so to the present day. Bayard Taylor gives a vivid and luminous description of the behaviour of the asses of Cairo, as witnessed by him while on a visit to that city. According to Mr. Taylor, the natives of the East have a notion that the Frank is incapable of pedestrianism, and that if he be met walking it is only because he is looking for a donkey boy. They won't believe otherwise, and the gentleman quotes as an example the case of a friend of his, who for two hours was closely attended by a cavalcade of six donkeys and six donkey drivers, clamouring and braying for the "howadji's" custom.

"The donkeys are so small," writes Mr. Taylor, "that my feet nearly touched the ground, but there is no end to their strength and endurance. Their gait, whether in pace or gallop is so easy and light, that fatigue is impossible. The drivers take great pride in having high-cushioned red saddles, and in hanging bits of jingling brass to the bridles. They keep their donkeys close shorn, and frequently beautify them by painting them various colours. The first animal I rode had legs barred like a zebra's, and my friend's rejoiced in purple flank and a yellow belly. The drivers run behind them with a short stick punching them from time to time, and giving them a pinch on the rump. Very few of them own their donkeys, and I understood their pertinacity when I learned that they frequently received a beating on returning home empty-handed.

"The passage of the bazaars seems at first quite as hazardous on donkey backs as on foot; but it is the difference between knocking somebody down and being knocked down yourself, and one certainly prefers the former alternative. There is no use in attempting to guide the donkey, for he won't be guided. The driver shouts behind and you are dashed at full speed into a confusion of other donkeys, camels, horses, carts, water-carriers, and footmen. In vain you cry out '*Bess*' (enough), *Piacco*, and other desperate adjurations; the driver's only reply is 'Let the bridle hang loose;' you dodge your head under a camel-load of planks; your leg brushes the wheel of a dust-cart; you strike a fat Turk plump in the back; you miraculously escape upsetting a fruit-stand; you scatter a company of spectral white-masked women, and at last reach some more quiet street with the sensations of a man who has stormed a battery.

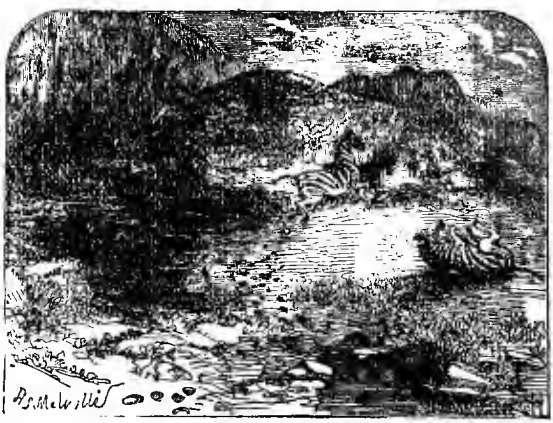
"At first this sort of riding made me very nervous, but presently I let the donkey go his own way, and took a curious

interest in seeing how near a chance I ran of striking or being struck. Sometimes there seemed no hope of avoiding a violent collision, but by a series of most remarkable dodges, he generally managed to bring me through in safety. The cries of the driver running behind gave me no little amusement. The howadji comes! Take care on the right hand! Take care on the left hand! Take care, O man! Take care, O maiden! Oh, boy, get out of the way! The howadji comes! Kish (the name of the donkey driver) had strong lungs and his donkey would let nothing pass him, and so wherever we went we contributed our full share of noise and confusion."

It would be difficult to find among brute kind a better fellow than the donkey, or one more easy to manage. The meanest stable, the coarsest food, are by him considered favours, and most gratefully received, and in exchange you are heartily welcome to all his sturdy strength and good will. Properly tended and groomed and with a decent harness on his back, he is far from an unhandsome beast; indeed, the difference in appearance presented by a donkey so treated compared with that of one whose constant food consists of chaff, tea-leaves, and cabbage-leaves, whose curry-comb is the stock of an old waggon whip, and whose stable is the domestic washhouse, must be seen to be believed. Even when kept in such an abject state its diseases are very few and mostly of a character that cleanliness and proper feeding would obviate. As to the age a donkey may attain without adopting the vulgar dogma that it "never dies at all," it may be safely said that it has a fair chance of outliving its master, supposing them to come together, boy and foal. There was one of these animals that many years ago drew up water from the well at Carisbrook Castle, in the Isle of Wight; what the age of this donkey was when he first took to water-drawing is not known, but it is certain that he faithfully fulfilled the task for fifty-two years, when he came to an untimely end by falling over the ramparts of the castle.

The ass's time for going with young is about eleven months, and seldom more than one foal is produced at a birth. At the age of four years the animal is in its prime. It is wonderful how Nature will assert herself deprived of all artificial processes brought to bear against her. Here we see the ass, whose progenitors, dead two or three centuries, were stabled and fed on grass and clover just as he is, preferring the dry, coarse thistle to the juiciest herbage, drinking as sparingly as though

still an inhabitant of the thirsty desert, avoiding, if possible, plashing his dry horny body in the wayside gutter, and never so happy as when on a sultry summer-day he can fling himself down on the hot dusty road, and leisurely rasp the length and breadth of his callous-hided carcase amongst the sandy particles.



ZEBRAS.

THE GOAT.

It was a great pity that the kind-hearted Mr. Hawes, who was instrumental in bringing to pass the Act of Parliament for the abolition of dog labour, did not at the same time bethink him to include the unfortunate *Hircus* family in relation to their use as beasts of draught. Perhaps the Legislature never supposed that so unlikely an animal as the goat could be adapted to harness, or that its obstinate head could ever be made to turn by the jerk of a rein; perhaps it never imagined that man could ever so abuse his dominion over the beast of the field as to force the goat to labour for his profit. It ought, however, to have known that meanness of such a depth was by no means improbable, for at the very time the dog question was under discussion a team of little fleas were tugging at a carriage in the exhibition-room at the Egyptian Hall for the entertainment of such of the public as were willing to pay a shilling for the sight.

Is there no generous M.P. of the present day who will see into this goat question? Let him any fine summer afternoon take a stroll to the suburbs—to Clapham, to Blackheath, or to Victoria Park—and there he will find animals of the goat tribe that killed and dressed would no more than fill a great dinner dish, toiling along the dusty road with a "chaise" at its heels, and a couple of Brobdignagian babies sitting in the chaise. "Make him go faster," says affectionate mamma to the goat-boy; "whip him and make him run." The goat-boy is nothing loth; he lays into the flanks of the poor little quadruped, who makes a frantic scramble forward and is only kept from sprawling on the ground by the strong-wristed goat-boy, who grasps the bridle and hoists him along at something like a trot. If not for sedate M.P.'s, there is among the goat-chaises plenty of work for the officers of the "Society for the Prevention of Cruelty to Animals," and with them I suppose we must be content to leave the grievance.

How the goat first came to be domesticated among us no one knows. Some naturalists opine that it is derived from the wild goat that roams the mountains of the Caucasus and Persia; others that the Ibex is the father of goats. But whatever doubts may exist concerning the derivation there can be none concerning its utility. In the time of our grandfathers, when wigs were universal, goat's hair was in high request: that which grew on the animal's haunches being most valuable

on account of its length. In the present times, however, goat's hair for wigs is at a discount in the market, being demanded only by church dignitaries and gentlemen practising the law. The skin of the goat, especially of the young goat, is invaluable to the glove-makers and to the preparers of morocco leather; its bones pass into the hands of the turner and are converted into knife-handles, &c. While it lives its milk is valuable for its nutritive qualities, and when it is killed its flesh is not to be despised. At least, so thought our ancestors, as the testimony of Pennant proves: "The haunches of the goat are frequently salted and dried, and supply all the uses of bacon. The meat of a goat six or seven years old is reckoned the best; being generally very sweet and fat. This, which makes an excellent pasty, goes under the name of rock venison, and is little inferior to that of the deer."

Buffon speaks in high terms of the goat. It is, according to that honest naturalist, superior to the sheep both in sentiment and dexterity. He approaches man spontaneously and is easily domesticated. He is sensible of caresses and capable of a considerable degree of attachment. He is robust and easily nourished, for he eats almost every herb and is injured by very few. Unlike the sheep, the goat fears not a great degree of heat, and will lie down to sleep in the sun's fiercest rays without discomfort. He is not afraid of rain or storms, but he appears to feel the effect of severe cold. The inconstancy of his disposition is shown by the irregularity of his actions. He walks, stops short, runs, leaps, approaches or retires, shows or conceals himself, or flies off as if actuated by mere caprice, and without any other cause than what arises from an eccentric vivacity of temper.

That the goat "fears not a great degree of heat," however, does not fully describe a speciality of the goat. It is the only one among quadrupeds who evinces no concern at the sight of flames. If urged it will approach a burning building and will not flinch till hurt by the heat. This peculiarity no doubt makes it a useful adjunct to the stable. Should the place catch fire and the lives of the horses be jeopardized, they may often be made to rouse from their panic-stricken state and to quit the burning building in an orderly manner at sight of their stable companion, the goat, marching on before as unconsciously as though nothing was the matter. By the bye, it may not be amiss here to quote a little sentence on the subject of fire in the stable, written by a cunning hand. "Under such circumstances

a horse may be easily removed from the scene of danger by harnessing him as usual, instead of trying to lead him out at once. The animal has learned to connect obedience and truthfulness with the harness, and while he bears the bit in his mouth and the saddle or traces on his back he will go wherever he may be led."

In the good old times when "physic" and "nastiness" were synonymous terms, the blood of an old he-goat dried and reduced to powder was considered an infallible cure for pleurisy and inflammatory disorders. At the same period, too, the shape of a goat was the most favourite one assumed by the father of evil when aiding and abetting a little choice witchery. It was a common occurrence for witnesses on witchcraft trials to swear that they had "with their own eyes" seen the wretched little old woman then in the dock, scudding through the air on the back of a goat, and, astounding as it seems to us, quite as common a thing for the dunder-headed judge to believe it. By the bye, I wonder if the goat's known contempt of fire had anything to do with its reputed familiarity with the bottomless pit. The animal, too, is said to be weather-wise, and may be seen hurrying home to seek shelter on the approach of a sudden storm.

That the goat is neither insensible to kindness, nor devoid of considerable intelligence, the following authentic story will go far to prove.

A person who had taken an active share in the rebellion of 1715, after the battle of Preston, escaped to the West Highlands, to the residence of a female relative, who afforded him an asylum. It was judged unsafe for him to remain in the house, so he was conducted to a cave in the neighbourhood and a faithful servant was appointed to carry him his food. The approach to the cavern consisted of a small aperture through which the gentleman crept; but as he advanced towards the further end, he found his passage disputed. In self-defence he drew his dirk, but, fearful lest he should be taking the life of a fugitive, such as he himself was, he held his hand, and soon discovered that it was only a goat with her kid lying in the cave. Such investigation as he could make in the gloom of the cave convinced him that the poor creature was in great pain arising from a fractured limb. He bound the leg with his garter, and offered the goat some of his bread; but this she refused to eat, and stretched out her tongue to indicate that she was parched with thirst. He then gave her water,

which she drank greedily, and, after her thirst was allayed, she partook of the bread. At the dead of the night he ventured from the cave, and, after listening attentively, he pulled a quantity of grass and the tender branches of trees, and brought them to her to eat. The only thing this fugitive had to arrest his attention and beguile the tediousness of his imprisonment was tending and curing his shaggy companion.

About the same time that the goat quite recovered, the servant who every night brought the prisoner food for the next day, fell sick, and another was appointed in his place. The goat, on this occasion, happening to be lying near the mouth of the cavern, opposed his entrance with all her might, butting him furiously. The fugitive, hearing a disturbance, went forward, and receiving the watchword from his new attendant, interposed, and the faithful goat permitted him to pass. So resolute was the animal on this occasion that the gentleman was convinced that she would have died in his behalf.

However much a favourite a goat may become, there are certain portions of the year—from September to November—when he is unfit, on account of the rank odour he emits, to approach the dwelling-house. At this time, too, you may depend on his exhibiting all the bad qualities he may happen to possess. It is generally believed, however, that the effluvium so objectionable to our noses is relished by horses, and that the latter animal is benefited by inhaling it. Mr. Bell observes, "Many persons keep goats in their stables from an idea that they contribute to the health of the horses; a fancy, perhaps, not far-fetched or absurd as at first sight might appear, for I believe that all animals are kept in better temper and in greater cheerfulness by the presence of a companion than in solitude, and the active and good-humoured goat may in this way really perform the benefit which has been attributed to it on mistaken grounds. Indeed, instances of close attachment between the horse and goat are not unfrequent."

The goat cannot grumble if, after having enumerated all his good qualities, I mention his worst. He is naturally mischievous and pugnacious. On the smallest provocation he will "show fight," and is capable of giving some awkward blows with his horns. He is extremely tyrannical, and if he finds people are afraid of him his behaviour will become very outrageous. There is, however, one easy method of subduing

him—catch hold of his beard. The lion then indeed becomes a lamb, and a very submissive lamb indeed, pitifully bleating for mercy as you haul him along. William Howitt tells a story of a great he-goat that was the terror of the hamlet in which he resided. One day as he took his morning walk he encountered an old woman, and as she was not nimble enough to get out of the way he coolly tumbled her into the mud. Such an outrage was not to be tolerated by the male inhabitants of the hamlet, so one more doughty than the rest went after the impudent brute and smote him on the head with a pole with which he was armed. King Hircus, however, took the blow no more to heart than though a nut had been filliped at him, but at once making a dash at his assailant served him as he had served the old woman—worse, for in her case he had merely shoved her out of his way and passed on, but in the case of the pole-bearer he first knocked him down, and then jumped on him, and there he took his stand till his owner came up the street, and seizing the bully by the beard, led him home meek as a kitten.

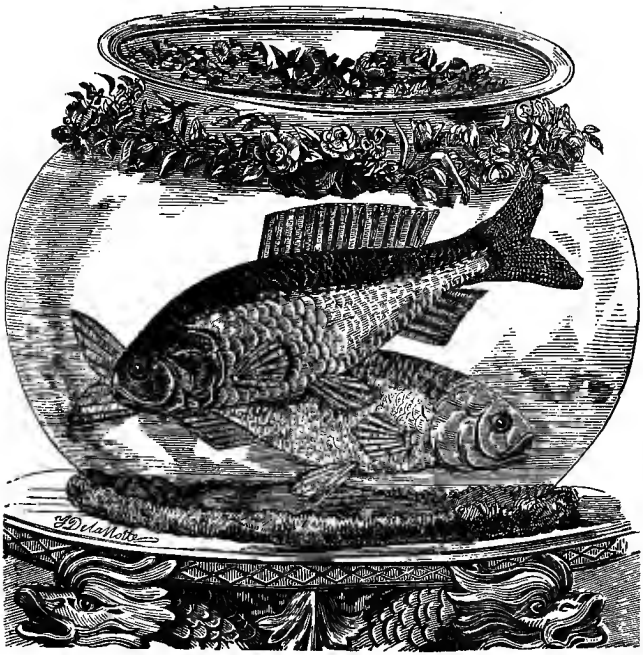
It has been a disputed point whether the goat and the chamois are identical. Appearances, however, are directly opposed to the supposition. The frontal bone of the goat, just before the horns, is convex, while in the chamois it is concave. The horns of the goat recede, while those of the chamois advance. One has a beard, the other has none. Above all, although on the mountain herds of goats are constantly wandering about near the haunts of the chamois, no one instance is known of a she-goat having brought forth young which were a cross between the two breeds. Indeed, it has been observed, that although the two animals never wage war, they scrupulously avoid each other's society.

Such, then, is the goat—take him or leave him. If you think him worthy to be included in your army of pets he will cost you very little trouble; he will eat just such food as the pony eats, he will sleep in the pony's stable. He may save the pony's life should the stable catch fire, and will always serve as a pleasant companion for it. By constantly observing him you may avoid going abroad on the eve of a storm, and so save incalculable sums by preserving your clothes—to say nothing of physic and gruel to cure your cold. Added to these advantages, if you should meet with a sturdy great-bearded old fellow of moderately good temper, there is no reason why he should not be put to draw a light chaise and

one light baby. As to baby's carriage, take care that it is "well hung," as the coachmakers say, and as light as possible. A four-wheeled carriage is the best; and no material is better—on account of its cheapness, cleanliness, and durability—than basket-work, such as is used in vehicles known as "Croydons," on account of their inventor living in the town of that name. Take care that there is room enough between the shafts, and that your steed is in no danger of abrasing his hind quarters against the fore-carriage. As regards harness the less you have of it the better. The same remark applies to the whip.

If you keep a she instead of a he goat she may present you twice a year with one, two, or three kids.

CHAMOIS.



AQUARIUM.

THE FRESH-WATER AQUARIUM.

With regard to the shape of your aquarium, the straight-sided tank is the best, for many reasons. If a round globe of glass be used, unless you peep over the edge of the vessel you will never see a single thing or creature it contains, in its real shape: your gold fish will be mere yellow blurs and patches, and your water-plants a green tangle. The glass vase is better than the spherical vessel; but even this is open to the considerable objection, that at a single blow—of a bit of your rock-ornament, or of an awkward fellow's elbow, for instance—your costly vase may be wrecked beyond repair; whereas, if the

square-sided tank be used, although much the same confusion and mess will attend a fracture, a glazier and a square of glass will put matters right again. Besides this, the hard and formal lines of the tank recommended will form a pleasing contrast to the delicate curves of the water-plants and the graceful outlines of the fish. The tank should be furnished with a cover, not necessarily air-tight, as fish can no more exist absolutely without air than ourselves, but fitting sufficiently close to prevent the escape of creatures of roaming habits, such as the newt and water-beetle. The pillars or "uprights" in which the glass sides are fixed should be of zinc; and if white lead be used by way of rendering the vessel "taut," that poisonous material should be coated with sealing-wax varnish. It is advisable, whatever the tank be made of, to soak it a few days in a tub of water before any attempt is made to stock it.

Next proceed to lay down a stratum of soil in which your water-plants may take root. Some years ago, when the aquarium first came into notice, it was thought necessary to transplant along with the plants a quantity of the mud from the bottom of the pond wherein they were found. As may be imagined, the vessel never presented a very handsome appearance: the movements of the fish stirred up the mud till it was as difficult to distinguish one finny inhabitant from another, as it is to recognize a friend in a London November fog; and "it was only when the fish were at rest," as observed an intelligent complainant of the period, "and there was nothing to be seen, that you could see it." It happens, however, that not one in a dozen of such pond-plants desirable for the aquarium derives nourishment from the soil that lies below the water: they merely use their roots as grapples to save them from drifting, while many of them have no root at all, but live entirely on the surface, floating hither and thither and changing their abode as chance decrees. Now since, as regards the plants, they take no delight in mud and only stipulate for anchorage, we may meet their demands, and at the same time in no way mar the beauty of our aquaria. Well-washed river sand three parts, and small pebbles one part, will answer admirably; the depth to which it should be spread should be regulated by the size of the tank; it should, however, never exceed three inches.

Next, as to the absurdity of cramming your aquarium with objects so decidedly non-aquatic, that it would be no wonder if the fish took fright at the monstrosities and died straight off. As says Mr. Cargill Brough:—"Many people have a notion

that an aquarium should be loaded with rockwork, and think that fantastic arches and minarets of Roman cement add to the beauty of the tank. If the vessel he very large, then a few irregular blocks of stone may be introduced with a good effect; but in a small tank we should recommend the exclusion of rockwork altogether, as it takes up a great deal of room that cannot be well spared, and unless it be very tastefully managed has a childish and ridiculous appearance. We need scarcely caution our readers against admitting sea-shells, branches of coral, plaster images, and other mantel ornaments into a fresh-water aquarium, though we have seen such a violation of taste perpetrated again and again. An aquarium should be made to imitate nature as closely as possible, and as we neither find cowries, corals, nor busts of Napoleon in our brooks and ponds, we have no right to introdnce such objects in our tanks." Gilbert White had occasion to animadvert upon a very similar barbarity practised by certain keepers of gold fish in his day. "Some people," he says, "exhibit this sort of fish in a very fanciful way, for they cause a glass bowl to be blown with a large hollow space within, that does not communicate with it. In this cavity they put a bird occasionally, so that you may see a goldfinch or a linnet hopping, as it were, in the midst of the water, and the fishes swimming in a circle round it. The simple exhibition of fishes is agreeable and pleasant, but in so complicated a way becomes whimsical and unnatural."

Before we proceed to describe the sort of plants that thrive best in the aquarium, besides looking handsomest and giving least trouble, it will be as well to explain why the presence of vegetable life is necessary to the very existence of your scaly pets. Indeed it was this necessity that led to the invention of the aquarium. Mr. Warrington was the first to draw public attention to the subject. He says:—"My attention was first drawn to the subject early in the year 1849. The speedy death of some gold fish that I had in a glass globe attracted my attention, and which, on experiment, I found was caused by the want of oxygen gas, a fresh supply being constantly required for their support; and also to the existence of a large quantity of carbonic-acid gas, which was given off during the respiration of the fish. What, therefore, was required was, something from which a supply of oxygen could be obtained, and which would also absorb or consume carbonic-acid gas. I found that aquatic plants were just what I required. I therefore commenced my further experiments in May of the same

year (1849), and chose for my first experiment two small gold fish. These I placed in a glass vessel, with some mould, stones, &c., and in it I planted a small root of vallisneria.

"All appeared to go on well for a time, until a portion of the plant, decaying, rendered the water turbid, and caused a growth of mucus, which adhered to the side of the glass, impeding the entrance of light into the interior, and with this stopped the supply of oxygen from the plants. I had therefore recourse to the useful services of the Water Snail; two or three of which I introduced into the vessel. These scavengers soon cleared away the decomposed matter; and from that time all went on well."

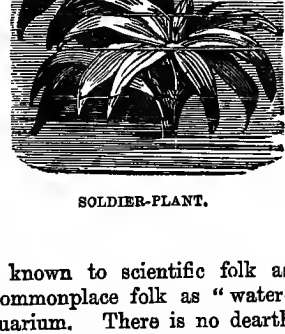
The facts are simply these. Vegetable life can only be sustained where carbon is present. This is derived from the carbonic-acid gas thrown off by all animals in the process of breathing, as well as by the decomposition of animal and vegetable remains. Nitrogen also enters into the structure of most plants, being found in that portion called gluten. Carbon, however, is the principal element of the vegetable world, and enters into and forms the more solid parts of the structure of plants; but. essential as it is to vegetable life, it would soon poison the water of an aquarium were it not absorbed by the plants contained therein. Plants, on the contrary, when acted upon by the direct rays of light, generate and throw off oxygen, which is as essential to animal life as carbon is to vegetable life, the blood of animals requiring to be perpetually purified by the continual addition to it of this elementary principle; and when this cannot be obtained, or is not present in sufficient quantity, the blood of the animal becomes impure, and life consequently languishes, or altogether fails; upon the same principle that a lighted candle expires in an unventilated well or pit. By bearing in mind and adopting the principle of natural chemistry, that the element oxygen which the plants refuse to absorb is the first necessary of life to the fishes, while the carbon thrown off by the fishes forms the sole food of the plants, you furnish both your animals and vegetables with the indispensable requirements by which breath is preserved and life maintained.

You may either purchase your water-plants of a dealer in aquaria, or you may save your money and enjoy a pleasant country excursion, by a personal study of pond botany. On account of its long and bright-green leaves, the Vallisneria is well suited as a plant for the aquaria. It has perennial roots, and requires but slight depth of soil. The economy of this

plant is very curious. "The female flowers are borne on long spiral foot-stalks, which, by means of a coil, rise to and float on the surface. The male flowers, on the contrary, are on straight and short flower-stalks, and when arrived at maturity detach themselves from the parent stalk, and, ascending to the surface, float among the female flowers, imparting to them the pollen with which they are laden; as soon as this process is completed, the female plant sinks to the bottom, there to perfect the intention of nature, and lay the foundation of another progeny." The Vallisneria, however, is found in running water, and not in ponds.

The water-crowfoot, that may be seen decorating the surface of pools in the month of May or April, should be sought after. It may be known by its white flowers, which bear yellow petals. The plant may be set in the sandy soil, or it may be simply placed in the water and left to its own resources; never fear but that it will flourish.

The soldier-plant is admirably adapted for the aquarium, as by nature it affects water of the stillest kind. It has broad saw-edged leaves, which spring from the top of its centre, and fall over gracefully. It is commonly found in the ponds of Surrey and Kent. Not only does the "water-soldier" form a variety to the other plants, but its broad arched leaves form capital lurking-places for the smaller sorts of fish.



SOLDIER-PLANT.

There is a new water-weed, known to scientific folk as *Anacharis alsinastrum*, and to commonplace folk as "water-thyme," well fitted for the aquarium. There is no dearth of this plant—indeed, although it has been intruduced into this country but a few years, the rapidity of its growth has created some little uneasiness in the minds of water-bailiffs. That it originally came from Canada is well known: how it got here is not so clear. The most prevalent legend, however, is, that one of the Cambridge professors having received a plant from a friend in Canada, kept it for some time in a glass jar; but not seeing any particular use in retaining it, threw it away down a drain that emptied itself into the river Cam.

The following year a great stir was made about a new weed which was fast choking up that river, and, upon inspection, the professor was much surprised to find it his old acquaintance which he had the year before parted with so unceremoniously. Another account says, that it was brought over adhering to logs of Canadian timber; and still another account, that, in whatever way it was imported, it must have been very many years ago, as the "oldest inhabitant" of Croydon has known it in the canal there since his youth. Whichever account is correct, there is the plant, and very pretty it looks with its brilliant green leaves. "Most of our water-plants," writes Mr. Hogg, "require, in order to their increase, to be rooted in the bottom or sides of the river in which they are found; but this flourishes altogether independent of that condition, and actually grows as it travels slowly down the stream after being detached." It is no less prolific in the aquarium than in its native stream, and must be constantly pruned.

SMALL WATER-LILY.

Plants of the lily kind are always pretty objects in the aquarium. There are the yellow and white water-lilies, with their handsome leaves floating on the surface with sufficient buoyancy to serve as rests for the smaller sorts of amphibia.

The *Hydrocharis morsûs ranæ*, or Frogbit, is a useful and interesting plant, of the lily kind in appearance, but belonging to the same order as the vallisneria, and, like that plant, the circulation may be detected in the leafstalks. It has a pretty appearance in the aquarium, where it will thrive well and bloom freely. The body of the plant, resting on the surface of the water, derives its nourishment from the roots at the bottom of the vessel, by means of its long spiral stalks, which descend to it, and, like the female flower of the Vallisneria, its foliage can accommodate itself to the surface of the water. This

plant dies away in the winter; but during the autumn a series of small cones are formed attached to stalks proceeding from the parent plant; these, in due time, are detached, and float on the surface; but, on the approach of winter, gradually sink. At the approach of spring they gradually unfold themselves, and in a few days assume the shape of the perfect plant.

To the above list might be added brook-lime (its sky-blue flowers are extremely pretty), the water-violet, the horse-pond weed, the water-starwort, and many others.

Assuming that you have prepared the soil within the tank, and set in it the roots of such plants as you most admire, you may next put in the water; and, simple as the operation may seem, unless it be managed with care, you may have all your planting to do over again, the sand will yield to the influence of the water, and you will be edified by the sight of a hotch-potch of sandy water, in which are floating your carefully-sown weeds. This will happen if you dash the water in suddenly, which, of course, after this caution you will not do. The best way is to stand a basin at the bottom, and gently brim it over with water till the tank is filled to the basin's edge. After this as much more water as required may be added with impunity. After you have waited a day or so, that the plants may properly aërate the water, you may introduce your "live stock." Here, again, you must use discrimination, and by no means take it for granted that because a fish is very small and very lively that it is "just the thing" for your aquarium. For instance, there is the stickleback, of which Dr. Lankester discourses so pleasantly. "Whether," says the Doctor, "we regard his high organization, his courageous nature, his domestic habits, his varied instincts, his power of living in all waters, at all temperatures, he is fairly entitled to take the first place among fishes, and rank high in the animal scale. And where is this wonderful fish to be got? The nearest pool, pond, or ditch that has life in it is sure to have sticklebacks. Take a walk on the nearest road out of any country town, and the chances are that the first boy you meet with a blacking-bottle or pickle-jar in his hand has got sticklebacks in it. You need not catch them yourself, a penny will buy you a score of them from these urchins. . . . . He has all the ways of other fishes, and many others besides. Look into your tank; see, there is one larger than the rest; he is clothed in a coat of mail like a knight of old, and it is resplendent with purple and gold. He is a male fish, and the king of your little shoal. He has

important offices to perform. Presently, in the course of a few days, if you watch him and are fortunate, you will see this wonderful little fish engaged, in the most useful manner, in building a nest. He seizes hold of one little bit of weed, then of another, and carries them all to some safe corner, till at last his nest is built. Having done this, he gently allures his mate to their new-made home. Here she deposits her eggs, and having done this, resigns the care of them to our hero of the purple and gold, who watches over them with an anxiety that no male in creation but the male stickleback seems to know. He fans and freshens the water with his fins, and at last, when the young are hatched, watches over their attempts at swimming with the greatest anxiety."

What can be prettier than this? What fish could be more desirable for the aquarium than the noble, chivalrous, tender-hearted stickleback? Alas! even his fast friend, Dr. Lankester, is compelled to admit that, despite all his excellent qualities, there is "something about him" that renders him a decidedly unpleasant companion to other little fish. "I have asserted that he is a royal fish," continues the Doctor, "and you will soon discover that he will bear no rivals. No sooner is he fairly free in your aquavivarium than he commences his reign —not always, I must confess, of the mildest sovereignty. The chances are, if you put him with fishes of his own size, you will find them all dead in the morning. Sad spectacle! disembowelled by the use of our pet's spines upon his neighbours' stomachs, their eyes picked out as delicate morsels for his morning meal."

After this the reader will experience no difficulty in deciding whether or no the stickleback shall be admitted a member of the tank. At the same time there can be little doubt that a vase of the pugnacious little fish, with some plants, and just a few snails to keep the house tidy, would afford considerable amusement.

Among the Carp family—from *Cyprinus auratus*, the golden-mailed, to *Cyprinus carpio*, the vulgar European carp—may be found fit subjects for the aquarium. They are the least numerous of fish, and stipulate only for a quiet life and plenty of vegetable food. The gold fish, which is a carp of Chinese origin, was, according to Tennant, introduced to this country at the end of the seventeenth century, and is now completely naturalized both here and in other parts of Europe. Most of the gold fish brought to the English market come from Portugal,

where they abound. It is subject to much variation, not only in the colour but in the fins, which are sometimes double, and not unfrequently have triple tails. In the latter case, however, it appears that the tail is thus developed at the expense of part or the whole of some other fin. When young the gold carp is of a very dark colour, approaching to black; this dark colour is replaced by the golden-red hue, more or less early according to the constitution of the individual. The silver carp is merely a variety of the same species, and both are as hardy as the commonest sorts, if treated with ordinary care.

Their tenacity of life is curiously illustrated in a paper furnished some time ago to *Household Words* by a celebrated naturalist:—"Last summer I was invited to inspect the result of a haul of gold fish from a small garden-pond near London. So mighty was the draught that it three-quarters filled a watering-cart, such as is used in London for watering the streets. All colours of the rainbow were reflected from their resplendent bodies. On sorting them, my surprise was great to find the majority of them alive, although, at that time, they had been out of the water twelve long hours. By the kind permission of the owner I selected half a dozen of the finest, intending to have a fry, never having tasted such a regal dish. These victims were placed in a basket, and left all night in a cellar. The next day their panting gills proclaimed that life was not yet extinct. I placed them in a tub of water, and in a few minutes all but one recovered their spirits, and swam about as though nothing had happened; thus escaping the frying-pan, to spend the remainder of their days in a glass bowl."

The common carp, although not as gorgeous as his Chinese relation, is a handsome fellow. His upper parts are of a rich olive-brown, darker about the head than elsewhere; the under parts delicate cream-colour; and the fins brown, tinged with red. It is wonderfully prolific, and its roe has been sometimes found to turn the scale against the rest of the carcass. It is capable of attaining a very great age—two hundred years, say some naturalists, though others modestly fix the maximum of the carp's life at a century. Unless, however, your aquaria be of large dimensions, the carp will be found a little large, being commonly at least a foot long.

The species known as the Prussian carp is much more suitable. It may be easily known from the common carp by possessing no barbules on the lips. Its colours closely resemble those of the

common carp, except that its cheeks and gill-covers are of a brilliant orange hue, and its fins inclined to orange-red. It is rather local, but may be found in many ponds in the neighbourhood of London. The usual weight of the Prussian carp is about half a pound.

THE TENCH.

The Tench is a fish well fitted to be a tenant of the aquarium. Though common enough in kept and ornamental waters, it is but sparingly found in pools and rivers. Its usual length is about ten inches, and its general colour greenish brown or olive, having a golden hue, which latter tint is most conspicuous on the under parts of the fish. It may be easily known from the carp by the comparative smallness of its scales and from being more slender. It is peculiarly adapted to the narrow limits of the aquarium, where the quantity of oxygen is never over plentiful; for from experiments that have been made it is proved that the tench is able to breathe when the quantity of oxygen is reduced to a five-thousandth part of the bulk of the water. The quantity of oxygen present in ordinary river water is one in the hundred. Indeed, from its tenacity of life, the tench might claim relationship with the *cat*-fish. "A piece of water," says Mr. Yarrell, "which had been ordered to be filled up, and into which wood and rubbish had been thrown for years, was ordered to be cleared out. Persons were accordingly employed; and, almost choked up by weeds and mud, so little water remained that no person expected to see any fish, excepting a few eels, yet nearly two hundred brace of tench of all sizes, and as many perch, were found. After the pond was thought to be quite free, under some roots there seemed to be an animal which was conjectured to be an otter; the place was surrounded, and on opening an entrance among the roots, a tench was found of most singular form, having literally assumed the shape of the hole in which he had of course for many years been confined. His length from eye to fork was thirty-three inches; his circumference almost to the tail was twenty-seven inches; his weight eleven pounds nine ounces and a quarter· the colour was also singular, his belly being that of the char or vermilion. This extraordinary fish, after having been inspected by many gentlemen, was carefully put into a pond, and at the

time the account was written, twelve months afterwards, was alive and well."

Don't forget the Minnow from your list of "likely subjects." Although seldom or never found in any other than clear running streams, no fish thrives better in the still water of the aquarium. Its form is round and slender. The top of the head and back are of a dusky olive-colour; the sides of the body pale and mottled; the belly white and silvery, with a tinge of yellow, and sometimes in summer of a bright red colour. After a short residence in the aquarium, the minnow will become exceedingly bold and evince a degree of intelligence certainly equal to that of the unlucky seal which some time ago was exhibited in Piccadilly, and which, if you could believe its exhibitor, owed its captivity to the mischance of being heard to call its "ma" in the hearing of a wary seal-catcher. There is not the least doubt that the minnow is quite as capable of crying for its mother as the seal; and if it does not exhibit the faculty—considering what is likely to come of it—its prudence is certainly commendable. It has no objection, however, so far to betray the depth of its intelligence as to flock to the edge of the tank at the sound of a voice with which it is pleasantly familiar, or take from between the finger and thumb the proffered morsel.

The Roach is a pretty enough fish, but from his natural habit of preferring still deep water, and his considerable size, he had better be excluded from the list, unless your aquarium be very large. It may be found in deep and quiet streams. It is a gregarious fish, always swimming in large shoals, and feeding on worms and water-plants.

The Miller's-thumb, or Bull-head, although, on account of its slow skulking disposition, not so well fitted for the aquarium as the more lively species of fish, deserves consideration on account of its curious shape. It may be found in clear brooks and rivers throughout the country. It is about five inches long, with a large, broad, roundish-shaped head; the gills are round and beautifully notched, and the rays of all the fins curiously spotted. Its general colour is brownish black on the back, light brown with black spots on the sides, and white under the belly. It is generally found under loose stones. According to the author of "British Fishes," this fish takes its name from the resemblance borne by its head to the thumb of a miller. "The head of the fish, it will be observed, is smooth, broad, and rounded, and is said to resemble exactly the form of

the thumb of a miller. The miller's ear is constantly directed to the noise made by the running-stone in its circular course over the bed-stone, the exact parallelism of their two surfaces, indicated by a particular sound, being a matter of the first consequence; and his hand is as constantly placed under the meal-spout to ascertain by actual contact the character and quality of the meal produced. The thumb, by a particular movement, spreads the sample over the fingers; the thumb is the gauge of the value of the produce, and hence the origin of the sayings, 'Worth a miller's thumb,' and 'An honest miller hath a golden thumb,' in reference to the amount of profit that is the reward of his skill. By this incessant action of the miller's thumb a peculiarity in its form is produced which is said to resemble exactly the shape of the head of the fish constantly found in the mill-stream."

The *Cobitis*, or Loach, is eligible as an inhabitant of the aquaria. In a state of freedom it prefers the running stream, and delights to sport about the banks, but feeds at the bottom. The mouth is furnished with from two to six barbules. The scales of this fish are exceedingly small, and of a spotted olive-colour. Loaches will thrive well in an aquarium; and, from their restlessness on the approach of rainy weather, become very good barometers. During very hot weather their favourite position is that of repose—lying on the surface of the water-lilies. The length of the loach is from three to four inches.

Small Eels look very well in an aquarium; their sinuous movements, so contrary to the graceful swimming of the previously-named fish, gave a variety to animated scene that is not unpleasant.

Besides those here enumerated there are several others, including the Gudgeon, the Dace, and, while it is young and not yet possessed of its voracious appetite, the Perch.

Young Frogs and Tadpoles are interesting objects for the aquarium, only you had better string your nerves for the appalling sight of one of the larger animals ferociously chasing the poor little mite and gobbling it up before your eyes. Much interesting matter has been written respecting the birth and infancy of this well-known Batrachian. Some time in the month of March the frog deposits its spawn, consisting of a mass of gelatinous matter somewhat resembling size used by house-painters, and in which are embedded the eggs. Within four or five weeks the little tadpoles break from the eggs, and may be seen shifting and moving uneasily, and finally they eat

their way through the jelly and enter upon their aquatic existence. When first hatched, they feed on the remains of the gluten in which they were embedded. In this stage of their existence they bear but small resemblance to a frog, being merely head and tail; the former large, black, and roundish; the latter slender, and bordered with a very broad, transparent finny margin. Their motions are extremely lively, and they are often seen in such vast numbers as to blacken the pool they inhabit. When the tadpole has arrived at the age of five or six weeks the hind legs make their appearance, gradually increasing in length and size, and in about a fortnight afterwards are succeeded by the fore-legs. It now partakes of the form both of a frog and a lizard; but this state of things does not continue many hours: the tail immediately begins to shrink and wither, and in about thirty hours has vanished entirely. The indefatigable Mr. Lewes has furnished the world with some curious facts about the tail of the tadpole. If the caudal appendage of one of these creatures be cut off before it is ready to dispense with it, the tail will continue to live for several days, and not only live but *grow*. "The discovery," writes Mr. Lewes, "is none of mine,—it was made by M. Vulpian, in Paris. He says that the tails constantly lived many days—as many as eighteen on one occasion; but I have never kept mine alive more than eleven. He says, moreover, that they not only grow as I have said, but manifest sensibility, for they twist about with a rapid swimming movement when irritated. I have not seen this; but M. Vulpian is too experienced a physiologist to have been mistaken, and with regard to the growth of the tails, his observations are all the more trustworthy because he daily made drawings of the aspects presented by the tails, and could thus compare the progress made. The tail will only live apart from the body so long as it retains its early immature form, that is to say, so long as it has not become highly organized. If you cut it off a tadpole which is old enough to have lost its external gills a week or more, the tail will *not* live more than three or four days. And every tail will die as soon as it reaches the point in its development which requires the circulation of the blood as a necessary condition."

I would, however, impress on the younger portion of my readers that the above interesting particulars are intended merely as stimulants to their interest, as they watch the curious tadpole steering in its crystal prison, and not as an incentive

to practical experiment. If the youthful proprietor of an aquarium took a tadpole, and with a pair of scissors cut its tail off, the chances are that the life of either portion would not be worth an hour's purchase.

The Newts are well worthy a place in the aquarium. Unfortunately (fortunately, perhaps, a newt would write it) the popular feeling is against this singular creature, and we have often heard even grown-up people declare that they could not be comfortable with such a hideous little monster in their neighbourhood. There is no denying that the eft, as it is sometimes called, has a weird and antediluvian aspect; but surely it is none the less desirable on that account. "It is so dreadfully suggestive of crocodiles and such-like dreadful things," says some one else; well, there is no accounting for taste, it is true; but to *our* thinking, this latter, instead of forming an objection, is a decided recommendation.

However, there he is for any one who has a fancy for him. There is scarcely a ditch in the country in which the great water-newt may not be found. It is about six inches long, and in appearance much resembles the salamander, of whose fire-resisting powers such funny stories are told. Its colour on the upper parts is dark brown, the sides being marked with small white specks; the under parts are bright orange-colours, blurred with irregular black patches. The tail is flat, with thin edges, and flattened at the extremity. The eyes are of a bright gold-colour, and the head small. It is a terrible glutton, and the tadpole's worst enemy. He is worse than a glutton—he is a cannibal, and has been repeatedly caught in the act of devouring his cousin, the little water-newt. Bell, the naturalist, relates that he has captured the big newt with the little newt stuck in his throat.

One of the most marvellous facts connected with this animal is its powers of reproducing its limbs. Among other cruel experiments that the growth of science appears to demand, has been that of cutting off the limbs of this species of Amphibia for the sake of seeing whether nature would repair the wanton outrage. The arms or thighs of these animals have been amputated, sometimes on one side, sometimes on the other, or both on the same side, and the limbs in every case have been re-produced—the toes even being re-formed and endowed with motion. The unlucky creature's tail has been cut off by the stump, but in a short time it has pushed its way out and become a tail again. In one case the same limb

was amputated *four* times, and as often renewed. Dumérel, the French anatomist, played a still more cruel trick with nature. He cut off three-fourths of the head of one of these creatures with a pair of scissors. It was placed in a tank by itself, and actually existed for three months *without a head*. Even at the expiration of that time it was killed by neglect. It is to be seen to this day in the Paris Museum. Who, after this, will deny that the newt is a most singular creature? He will devour his own brother with a relish; can grow new limbs with as much facility as a plant sends out new branches; and treats decapitation as a joke.

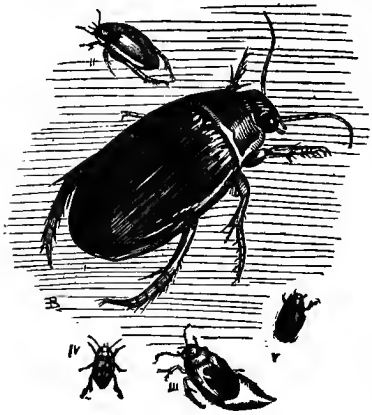
The little water-newt is found in the same ditch as his big brother. Except that it is about half the size of the latter, it is the same-looking creature.

Should the reader be inclined to add Spiders and Beetles to his aquatic menagerie, he has a tolerably large field to choose from. There is the diving-spider. This curious creature weaves its net under water, attaching the stays of it to the leaves and stems of the water-plants; it, moreover, spins for itself a sort of tent shaped like half a pigeon's egg. In this cell it lurks, waiting for a victim to be taken in its net, when it speedily disentangles it, and carries it in doors to devour at its leisure. Although an aquatic insect, the diving-spider seems to require more air than water alone affords. To meet this emergency, nature has provided it with a marvellous apparatus. Its abdomen and the surrounding parts are covered with a sort of second skin, and between the walls is stowed a stock of fresh air for the spider's use when it is submerged. When inflated with air, the insect bears the appearance of carrying on its back a globule of quicksilver. If closely watched, it may be seen frequently to approach the surface of the water, and by a peculiar movement of its teat-like appendage to replenish its air-reservoirs. The chief drawback to the diving-spider's admittance to the tank is, that fish of all kinds evince a decided partiality for it; and however well its nimbleness might serve it did it have but one enemy to elude, when it is surrounded

THE WATER-SPIDER.

by a dozen its chance of longevity is small. It is, however, such an interesting little architect, that a clean bottle of largish dimensions might be profitably spared it.

As regards the Water-beetles, the largest of the family (*Hydrŏus piscus*) is one of the few sufficiently harmless to be placed in the aquarium with impunity. Besides being harmless, the large water-beetle is serviceable as a scavenger by clearing from the plants the animalculæ that collect thereon. It is better to buy creatures of this sort from the regular dealer in aquaria than to catch them yourself and trust to chance as to their natures: you might make the most dreadful mistakes. Suppose, for instance, in your innocence, you introduced to your finny friends a few members of the *Dytiscus marginalis* family. This terrible fellow, which even in its comparatively harmless larvahood is known as the "water-devil," makes it his business to attack every living thing that crosses its path. It is sometimes advertised as an insect that will live at peace with its fellows; if so, the matured beetle is less ferocious than the larva, for, according to Dr. Lankester, he put two together in a bottle, and when, in the course of an hour he reached home, there was but *one*—the other was killed and eaten. They have no stings, but bite furiously and effectively with their upper jaws,



THE WATER-BEETLE.

HARMLESS WATER-BEETLE

which are pointed at the tips and serrated—that is, have a toothed or saw-like edge inside. With these they seize their prey, and masticate it with their under-jaw. Nothing which they can adhere to seems to come amiss. One full-sized water-beetle will, in the course of twenty-four hours, kill and eat a small frog and two or three small-sized fishes.

The beetle known as the "water-boatman," although addicted to eating any of the small fry of his own or any one else's tribe, is a very interesting fellow. It may be known by the peculiar construction of its hind legs, the lower joints of which are fringed and compressed, and somewhat resemble oars, by which the insect is enabled to propel himself through the water with great rapidity. In shape, the body is thick and triangular, and the outer half of the superior wings fold over each other. Its habits are very singular. All day long it lies on the surface of a ditch, belly uppermost, and its limbs fully stretched out as though he were the most luxurious and lazy fellow in beetledom; but this is merely a *ruse;* idle as he seems, he is broad awake to all that is going on around him; and should any likely prey approach within reach of the boatman's long limbs, it is clutched without mercy, and off shoots the insect to devour it at its leisure. This is its daylight behaviour; but as evening approaches, it assumes quite a new aspect: it no longer reclines on its back, but, assuming a natural position, unfolds a pair of handsome wings, and sails into the air to prey on such tiny insects as may happen to be abroad. This last feature of the boatman's character should be borne in mind by those who think of giving him a place in their aquarium.

THE BOATMAN.

Caddice Worms, says the author of the "Indoor Naturalist," may be introduced into the tank with safety, and their clumsy attempts at locomotion will afford the observer considerable amusement. These worms are the larvæ of various species of *Phryganea.* To protect their soft bodies, which constitute a favourite food with fishes, they always inclose themselves in cases formed of various materials—bits of straw and sticks, pebbles, and even small shells being employed in this manner. The materials are kept together by silken threads, which they spin from the mouth in the same manner as the caterpillars.

When about to assume the pupa state, the larvæ fix their cases to some solid substance beneath the water, and close the two extremities with a kind of grating which, while it excludes intrusive enemies, freely admits of the passage of water through the tube, the water being required for respiration. When nearly arrived at their perfect form, they eat their way through the grating with a pair of strong mandibles specially provided (or so it would seem) for this one object. They then swim to the surface and undergo their final change in the air.

The original promoters of the aquarium—among whom Mr. Warrington occupies a prominent place—were suddenly brought to a dead stand through a difficulty they had not anticipated. As the older leaves of the plants decayed, a green scum began to settle on the surface of the water and on the sides of the tank, shrouding the carefully-nurtured specimens of animal and vegetable life with an ugly veil. In the hands of a man of less thought and patience than Mr. Warrington, the obstacle would have been regarded as insuperable, and the whole project abandoned. It occurred, however, to the acute experimentalist to enlist the services of certain of the mollusca, whose nature it is to possess an appetite for just the sort of garbage that bade fair to nip the aquarium notion in the bud. The large number of these scavengers afford a wide field for selection; but some care must be used in selecting such of them as really prefer the *confervæ*, or vegetable decay, and not the vegetables themselves, otherwise you will not be able to keep a decent plant in the tank. Bear in mind, too, that it is very easy to *overstock* the aquarium with these rubbish-consumers; although they may prefer garbage, you may depend they will not allow respect for your choice plants to stand in the way of their hunger. It is next to impossible, however, to give exact directions as to the number of scavengers your tank should contain; nothing but experience will enable you to arrive at a correct balance.

Among the most suited to the purpose are the Paludina, or Fresh-water Winkle, and the Planorbis, or Trumpet-snail. The last is an inhabitant of most ponds and ditches, and may therefore be easily obtained, as may the former. The *Helix bombex* is a smaller species of fresh-water snail, but is very useful as a purifier of the aquarium; from the smallness of its size, it is, perhaps,

THE TRUMPET-SNAIL.

best adapted for the globe. In shape it is rounder and more slender than the trumpet-snail, and appears more elongated or drawn out.

Besides the above, there are two others worth mentioning—the "Swan-muscle," plentiful in the New River and the river Lea; and the Fresh-water Whelk, to be found at the bottoms of ditches.

HELIX BOMBEX.

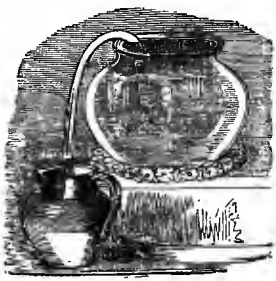
The accumulation of the green stuff on the sides of the tank is frequently accelerated by too strong a glare of light being allowed to play through the sides. This may be avoided by shading the side of the tank next the window with green tissue paper, which will not obstruct the light, but merely subdue it. Moreover, as says Mr. Lloyd, "It is not the mere placing of a quantity of plants, and then a quantity of fish, &c., in a vessel of water that constitutes an aquarium; there must be discrimination used between those plants that will thrive and give off the least amount of mucous or slimy matter, and that will also thrive in an artificial state, and those that will not; the same may also be said of the fish, &c. Quantity is also another great point; for it is to be borne in mind that the object is to have such a balance as will keep the water in a state of purity, so that it shall not require changing. The exact quantity of each to keep up this balance has not been determined, and, indeed, nothing but actual experience will demonstrate it."

THE FRESH-WATER WHELK.

In hot summer weather the decomposition of your plants will, of course, be more rapid than in mild weather—indeed, it will sometimes happen that, despite the industry of your scavengers, the *confervæ* will accumulate too fast for them. If this happens, you had better give them some assistance. Tie a piece of sponge to a bit of cane, or make a little mop of wash-leather, and once or twice a week pass it thoroughly over the interior surface.

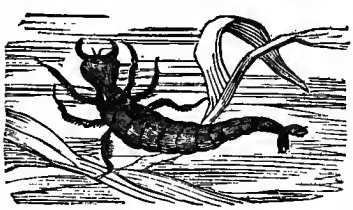
Under such circumstances, too, the water will require to be frequently changed—how frequently you will easily understand by its condition. While it is perfectly clear, do not touch

it; but should it become turbid, get ready your water-jug and syphon. This latter instrument is easily constructed. Any piece of lead, glass, or gutta-percha tubing will do if bent in the shape shown in the engraving. Let the smaller end dip into the water; then, taking the longer end in your mouth, draw the air out of the tube, when the water will follow, and continue to do so as long as the shortest end continues under water. When as much water is taken out as you consider necessary, you may, by means of the fine rose of a long-necked garden or greenhouse watering-pot, restore a like quantity of fresh water, which, if put in in this way, will fall like a very fine shower of rain, and will aërate the water, which it is very advisable should be done. Or, instead of putting the syphon into the mouth, turn up both ends and fill the tube with water; place a finger over each end, to prevent the water escaping; put the small end into the water, and, taking the finger from the other end, the water will flow freely.

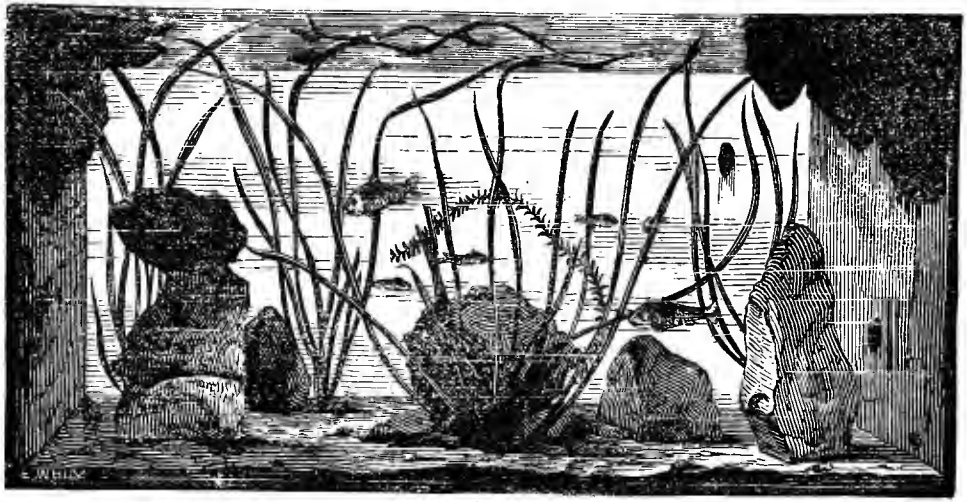


SYPHON.

It is the expressed opinion of the inventor of the aquarium, that three, or at most four, animate objects are enough for each gallon of water; experience, however, has shown that, with moderate attention, double this number — of small size, at least—will do well and thrive in the quantity of water mentioned. If, however, this proportion should be exceeded, extra care must be observed to keep the water thoroughly aërated. The nozzle of a pair of bellows introduced into the tank will in a rough way effect this; or it may be done by the suspension above the tank of a bottle, from which drips of water are constantly falling; each drip will be highly oxygenated, and carry with it new life to the fishes.



WATER-TIGER.



THE MARINE AQUARIUM.

As regards the economization of the vital elements of animal and vegetable life, precisely the same rules apply in the case of the marine as the fresh-water tank. "The sea is full of creatures that require, as well as the land animals, to breathe air containing oxygen enough to support life. Therefore the sea includes not only a realm of its own animals, but also a

realm of its own plants. The plants, besides furnishing nutritious pasturage, carry on a wholesome chemical process, under the surface of the water, for the manufacture of a main ingredient in the breath of life. The fishes, however, are not left to depend wholly on this means of support. The billows of the great ocean beat the air, and, catching it in the form of foam bubbles, force it down to considerable depths, and cause it, both in its descent and in its rising again to the surface, to come into contact with the water that requires its purifying influence. The sea beats upon the beaches and dashes itself into a thick froth upon the rocks; that is to say, beats air into itself on an extensive scale, and carries the precious bubbles so obtained even to considerable depths. Its movement causes a constant change of surface water, to say nothing of the influence of currents." This may be worth the consideration of unthinking rhymsters who have no ambition beyond a jingle, and who lisp prettily about the waves "beating *idly* on the shore." If such a stupendous business as supplying millions of swimming and creeping creatures with the first principle of life, is *idleness*, pray what is the correct term for spoiling fair paper with such vapid scrawlings, of which the above-quoted line is a sample?

To return, however, to our tank. Owing to the more sluggish life of marine organization, and the greater amount of disorganized matter evolved, it is more difficult to preserve the balance of health in the salt than the fresh water aquarium. Contamination must be guarded against with the most scrupulous care. Sometimes, although every fish and every spray of sea-weed may appear perfectly healthy, the water will become as opaque as though a glass of milk had been added to it, and your nose will insist that animal decomposition is the cause of it. In all probability that sagacious organ is right,—certain members of a family of minute creatures imperceptibly attached to your ornamental rock-work have given up the ghost; and unless you speedily empty your amateur ocean, and provide your pets with a new sea, they will speedily die too.

After all, however, the difficulties of keeping the marine tank in a healthful condition are not nearly so great as they seem. Thorough aëration is all that is required; and to secure this it is only necessary to take every morning a portion of water out of the aquarium, and to allow it to drip back from some little height into the vessel. The water thus exposed to contact with the air, drop by drop, and further entangling and carry-

ing down air in small bubbles with it, will be maintained by these means in a state of perfect purity; in fact, as observes a clever reviewer of Mr. Gosse's work on marine aquaria, "there is no reason why the same supply of sea-water should not last for a twelvemonth or even longer. Of course during all this time loss by evaporation has to be supplied; but as the evaporation is of pure water only, all the salts remaining and becoming concentrated, it is only necessary to prevent that concentration by pouring in again as pure water whatever is poured out as watery vapour."

Should the proprietor of the marine tank, however, distrust this theory, there is no reason why he should not replenish the vessel with the genuine article just as often as he thinks proper, at an expence of sixpence a gallon. Whether all dealers in marine aquaria make this provision for their customers, or whether the trade is in the hands of a few of the best houses, I can't say. I know at least two dealers of whom sea-water may be bought: Mr. Lloyd, of 20, Portland-road, Regent's-park; and Mr. Hall, 75, London-wall. Nay, thanks to Mr. Gosse, the economist may save a fair portion of his sixpence by manufacturing *his own sea-water*. The following is the receipt:—

Common table salt	3½ ounces.
Epsom salts	¼ ounce.
Chloride of magnesium	200 grains troy.
Chloride of potassium	40 „ „

These materials, added to a gallon of water and thoroughly mixed, and there, in your parlour in Pentonville, you may be gratified by the sight, and feel, and taste of the "briny ocean," or something like it.

The tank prepared and the sea-water at hand, put in your bottom layer of sand. That from the sea-beach is of course the best, but if this cannot be obtained, well-washed river-sand will do nearly as well. Bits of rock may or may not be added, just as the fancy of the builder suggests. Now for your plants. Brown and olive sea-weeds should be avoided; they cannot endure the narrow limits of your tank, and will speedily die. Red and green weeds are the sturdiest, and without doubt the most beautiful. The "sea-lettuce" is recommended by Mr. Gosse, and certainly its broad, vividly-green leaves, delicate as gossamer, are very lovely; moreover, it is easily obtained, and will hardly be sought in vain between tide-marks if the hollows in the rocks are examined. Whatever plants be

selected. if they are rooted to the rocks, they must not be torn from their anchorage; the only way to preserve their lives is to chip off the fragment of stone to which they are attached. Therefore, when you go weed-hunting, put a hammer and a small chisel in your pocket.

As in the case of the fresh-water tank, it is better to allow your plants time to settle comfortably, and impregnate the water with oxygen, before you introduce your animals. According to the above-quoted authority none are so likely to thrive as the following:—

"*Fishes.*—The smaller sticklebacks; young specimens of the grey mullet, which have lived for more than three years in the Zoological Society's aquarium; the blennies and gobies; the spotted gunnel; the smaller wrasses; the rocklings; the flounder; the dab; and the eels.

"*Mollusca.*—The sea-hare; the periwinkle; the commoner tops; the purple; the murex; the chitons; the bullas; the scallops; the muscle; the modioles; the anomia; the oyster; and some of the sand-burrowing bivalves, as *Venus, Maetra, Pullastra,* &c. *Gastrochœna* and *Saxicava,* burrowers in stone, may be readily kept, and are very interesting, especially the former, which I have had in confinement for many months in more than a single instance, and still possess.

"*Cirripedes.*—The acorn barnacle (*Balanus* and *Chthamalus*) and the interesting little *Pyrgoma,* which is invariably found cemented to the plates of our larger madrepore.

"*Crustacea.*—The strawberry crab; some of the swimming crabs; the shore crab; the eatable crab; the hairy crab; the *Ebalia*; the masked crab; the soldier crab; the broad-clawed crab; the shrimps; the true prawns; the *Athanas;* and many of the *Entomostraca.*

"*Annelides.*—The gold comb; the sabellas; the serpulas; the sea-leech; the long worm; and the terebellas.

"*Zoophytes.*—Most species of sea-anemone (except the thick horn, *Bunodes crassicornis,* which is very precarious); both species of madrepore."

The reader will see, that among the fish for the marine tank the stickleback is allowed a place, whereas in the fresh-water aquarium his services were declined. It is, however, a very different matter. His companions are by no means of the milk-and-water stamp. Take the goby, "a fierce little cannibal fish about three inches long, that will vary the interest of the small drama always going on in the aquarium by taking the

demon's part. He has a good demoniacal name—the black goby—and a good demoniacal nature. He lurks under the rocks and weeds, whence he will dart out with glaring eyes to seize even one of his own cousins by the tail, and swallow him alive." The stickleback had best mind himself when he approaches the goby.

The writer who draws such a graphic portrait of the goby observes that many of the usual denizens of the aquarium display curious changes of colour; even the little grey mullets, the hardiest and most cheerful members of such a happy family, change, when greatly alarmed, from iron-grey to a pale drab colour. The little mullets, who always like to live together, dart about in shoals as lively as young chickens; chase each other after bits of bread or (sweetest of all to their palates) prawns or shrimp spawn, and always keep up in a quart or gallon or two of sea a pleasant bustle.

Although not the most beautiful, it cannot be denied that the vulgar periwinkle is one of the most useful members of the aquaria—he is the scavenger—the snapper up of "trifles" unconsidered by the careless tank-owner, but which if allowed to accumulate unchecked would soon bring the entire establishment to grief. It should be understood that, if the miniature ocean thrive, there will gather about the rock-works, and hang like a thick green curtain upon the glass sides of the vessel, a sturdy crop of bright green vegetation. The periwinkle is the mower who reaps the green crop, and his tongue is his scythe. "The watching of these mowers at work is one of the prettiest sights the aquarium affords. It may be seen by the naked eye, but the proprietor of a marine menagerie will find it worth while to assist his observations with a pocket magnifying glass. Though his shell is not very handsome the periwinkle, with his zebra stripes and netted markings, is a fairly pretty fellow when he comes out to eat the succulent young growths of sea-weed on the sides of the aquarium. It is delightful to observe the working of the little scythe made by his silky tongue, which is beset with rows of teeth that are themselves every tooth serrated. As the periwinkle eats, his fleshy lips open, and his glistening tongue makes a rapid stroke, rasping the green surf with its teeth, and as it works on leaving tiny marks exactly after the pattern of the marks left upon a grass lawn by a mower."

"The soldier crabs again, besides being worth careful study, enliven the business of an aquarium with a great many

curious incidents. As becomes soldiers they fight, and have passages of arms with one another; sometimes one soldier crab will even drag another out of the shell in which he lives, and take forcible possession of his premises. Then this crab, living in an old whelk-shell, often carries about pick-a-pack a fine sea-anemone, riding upon the shell as an outside passenger. It is at the same time almost always associated with a beautiful sea-worm, a two-lined nereis, that lives in a retreat of its own between the shell and the crab's body.

SOLDIER OR HERMIT CRAB.

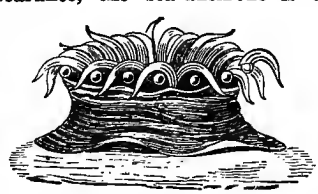
When the soldier is off guard, and is munching his bit of dinner, the head of the nereis will commonly be seen gliding round the crab's right cheek and passing between the upper and lower foot-jaws. Without scruple this intrusive lodger will then drag some of the food even out of the mouth of the warrior; and although the crab holds on and makes due efforts to rescue his property, or may perhaps frighten the nereis from its hold by making a terrible and sudden start, he never by any chance attempts to hurt the worm, or displays wrath at the indelicate behaviour of his delicate acquaintance."

Nothing shows so beautifully in the marine aquarium as the various species of *Actinia*, or "sea-anemones." Ellis, a celebrated investigator of this department of natural history, and who lived and wrote about a hundred years ago, was the first to apply to these creatures their floral appellation, because "their tentacles, being disposed in regular circles and tinged with a variety of bright lively colours, very nearly represent the

"MESS."

beautiful petals of some of our most delicately fringed and radiated flowers, such as the carnation, marigold, and anemone." The commonest of all the British species is scientifically known by the formidable name of *Actinia Mesembryanthemum*. Seen lying on the sea-shore, it presents the appearance of a sub-conical mass of brownish-green glass, that would serve admirably as a paper weight; ignorant of its true character, you attempt to take it up and find it limp and jelly-like. May be it will convince you that it is a living creature, by squirting a jet of sea-water into your face. You turn it over on what may be called its back, and probably find that an azure line encircles its base, and that a series of beautiful green lines converge from thence to the centre, while set round the creature's mouth is a circle of little knobs like turquoise beads, and which are supposed to be the animal's eyes. Lying on your hand it looks so unlike a living thing, that to settle the matter you place it where the next advancing wave may catch it up and carry it out. All speculation as to its being alive at once ceases; a hundred arms, its tentacles, are at once spread out, each one ready to grasp any eatable morsel that may appear within reach.

Despite its innocent appearance, the sea-anemone is as voracious as a shark, and endowed with a curiously powerful digestion, says the author of "Common Objects of the Sea Shore." I have often amused myself by watching them in their native haunts, and experimenting on their powers of digestion. One single "crass" (*Actinia crassicorius*) measuring barely three inches in diameter, required two crabs, each the size of a penny piece, and a large limpet, before it ceased to beg with extended arms. It is evident by the fact of the crab-eating, that the crass must possess great powers of grasp, or it could never hold, retain, or drag to its mouth, and finally devour a creature of such strength as a crab of the size above mentioned. Such a crab struggles with great violence, and requires a very firm grasp of the human hand to prevent its escape; and yet the anemone, whose entire body is not larger than the closed hand, and whose substance is quite soft, can seize and retain



"CRASS."

the crab, if it is unfortunate enough even to thrust one of its legs within reach of the tentacles.

It is generally believed that the various members of the actinia family possess the power of benumbing their prey. In some species little elliptical capsules are scattered over the whole surface of the body, in others confined to the tentacula, or even to their tips. These are furnished with minute spears, by which it is probable that not only are wounds inflicted, but poison is also conveyed into them. The sensations produced by the touch of the tentacula appear to be very different in the case of different persons,—from a mere rasping feeling to a slight tingling, or even to a stinging as by a nettle. Some of the anemone's poison-darts are only two or three times the length of the capsule which contains them, but others are much longer, and when within the capsule are coiled up after the manner of a watch-spring.

The sea-anemones possess the curious power of reproducing organs of their own body. Dr. Johnston relates a curious instance of this:—"I had once brought me a specimen that originally might have been two inches in diameter, and that had somehow contrived to swallow a valve of *Pecten maximus* (a shell-fish of the oyster family), of the size of an ordinary saucer. The shell fixed within the stomach was so placed as to divide it completely into two halves, so that the body stretched tensely over it had become thin and flattened like a pancake. All communication between the inferior portion of the stomach and the mouth was of course prevented; yet instead of emaciating and dying of an atrophy, the animal had availed itself of what had undoubtedly been a very untoward accident, to increase its enjoyments and its chances of double fare. A new mouth, furnished with two rows of numerous tentacles, was opened up on what had been the base, and led to the under-stomach. The individual had indeed become a sort of Siamese twin, but with greater intimacy and extent in its unions."

The hardiest of this singular family and that most easily "domesticated," is the *Mesembryanthemum*. It may be detached from the rock where it is found by sliding beneath it an ivory paper knife, or even by levering it up with the thumb nail. The next most desirable anemone is one of the largest of those found on the British coast, and whose name is *Bunodes crassicornis*. This creature exhibits a great diversity of the most beautiful colour; white, cream colour, brilliant red, green.

and orange, and scarlet and white are among the hues that distinguish it. This, and many others that might be enumerated, are not as easily made to quit their hold on substances to which they may be attached; and, as to injure their organs of adhesion would be to render them worthless, it is better, where it can be accomplished, to chip off that portion of the stone to which they are anchored.

Did space permit, much more might be written of the curiosities of the marine tank. That, however, is not our purpose. The little that has been described may perhaps whet the interest of our readers lucky enough to possess already a well-stocked tank; or, better still, to determine those who previously were only half resolved to set about the instructive amusement of constructing an aquarium.

For the benefit of such of our readers who, from prudential motives, may prefer acquiring the art of managing the marine aquarium by easy stages, we will take the liberty of extracting from Mr. Charles Kingsley's "Wonders of the Sea-Shore," the following simple directions:—

"Buy at any glass-shop a cylindrical glass jar, some six inches in diameter and ten high, which will cost you from three to four shillings. Wash it clean, and fill it with clean salt water dipped out of any pool among the rocks, only looking first to see that there is no dead fish or other evil matter in the said pool, and that no stream from the land runs into it. If you choose to take the trouble to dip up the water over a boat's side, so much the better. So much for your vase. Now to stock it. Go down at low spring-tide to the nearest ledge of rocks, and with a hammer and chisel chip off a few pieces of stone covered with growing sea-weed. Avoid the common and coarser kinds (*Fuci*) which cover the surface of the rocks, for they give out under water a slime which will foul your tank; but choose the more delicate species which fringe the edges of every pool at low-water mark. The pink coralline, the dark blue, ragged dulse (*Rhodymenia*), the Carrageen moss (*Chondrus*), and, above all, the delicate green ulva, which you will see growing everywhere in wrinkled fan-shaped sheets, as thin as the finest silver paper. The smallest bits of stone are sufficient, provided the sea-weeds have hold of them; for they have no real roots, but adhere by a small disc, deriving no nourishment from the rock, but only from the water. Take care, meanwhile, that there be as little as possible on the stone beside the weed itself. Especially scrape off any small sponges,

and see that no worms have made their twining tubes of sand among the weed-stems. If they have, drag them out, for they will surely die, and as surely spoil all by sulphuretted hydrogen, blackness, and evil smells. Put your weeds into your tank, and settle them at the bottom, which last, some say, should be covered with a layer of pebbles; but let the beginner have it as bare as possible, for the pebbles only tempt cross-grained annelids to crawl under them, die, and spoil all by decaying; whereas, if the bottom of the vase is bare, you can see a sickly or dead inhabitant at once, and take him out (which you must do) instantly. Let your weeds stand quietly in the vase a day or two before you put in any live animals, and even then do not put any in if the water does not appear perfectly clear, but lift out the weeds, and renew the water ere you replace them. Now for the live stock. In the crannies of every rock you will find sea-anemones (*Actiniæ*), and a dozen of these only will be enough to convert your little vase into the most brilliant of living flower gardens. There they hang upon the under side of the ledges, apparently mere rounded lumps of jelly. One is of dark purple dotted with green; another of a rich chocolate; another of a delicate olive; another sienna yellow; another all but white. Take them from their rock: you can do it easily by slipping under them your finger-nail or the edge of a pewter spoon. Take care to tear the sucking base as little as possible (though a small rent they will darn for themselves in a few days easily enough), and drop them into a basket of wet sea-weed. When you get home turn them into a dish full of water, and leave them for the night, and go to look at them to-morrow. What a change! The dull lumps of jelly have taken root and flowered during the night, and your dish is filled from side to side with a bouquet of chrysanthemums. Each has expanded into a hundred-petaled flower, crimson, pink, purple, or orange. Touch one, and it shrinks together like the sensitive plant, displaying at the root of the petals a ring of brilliant turquoise beads. This is the commonest of all the Actiniæ (*Mesembryanthemum*). You may have him when and where you will; but if you will search those rocks somewhat closer you will find even more gorgeous species than him. See in that pool some dozen noble ones in full bloom, and quite six inches across some of them. If their cousins whom we found just now were like chrysanthemums, these are like quilled dahlias. Their arms are stouter and shorter in proportion than those of the last species, but their colour is equally brilliant.

One is a brilliant blood red; another a delicate sea blue, striped with pink; but most have the disc and the innumerable arms striped and fringed with various shades of grey and brown. Shall we get them? By all means, if we can. Touch one. Where is he now? Gone? Vanished into air or into stone? Not quite. You see that sheet of sand and broken shell lying on the rock where your dahlia was one moment ago. Touch it, and you will find it leathery and elastic. What, is this all which remains of the live dahlia? Never mind; get your finger into the crack under him. Work him gently, but firmly out, take him home, and he will be as happy and as gorgeous as ever to-morrow. Let your Actiniæ stand for a day or two in the dish, and then, picking out the liveliest and handsomest, detach them once more from their hold, drop them into your vase, right them with a bit of stick, so that the sucking base is downwards, and leave them to themselves thenceforth.

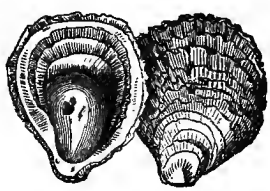
"These two species are quite enough to give a beginner amusement; but there are two others which are not uncommon, and of such exceeding loveliness that it is worth while to take a little trouble to get them. The one is Bellis, the sea-daisy. It is common at Ilfracombe and at Torquay, and, indeed, everywhere where there are cracks and small holes in limestone or slate rocks. In these holes it fixes its base, and expands its delicate brown-grey star-like flowers on the surface; but it must be chipped out with hammer and chisel, and at the expense of much dirt and labour; for the moment it is touched it contracts deep into the rock, and all that is left of the daisy flower, some two or three inches across, is a blue knob about half the size of a marble. But it will expand again after a day or two of captivity, and well repay the trouble it has cost.

"The other is Dianthus, which you may find adhering to fresh oysters, in any dredger or trawler's skiff, a lengthened mass of olive, pale rose, or snow-white jelly; the rose and the white are the most beautiful. If you find one, clear the shell on which it grows of everything else (you may leave the oyster inside if you will), and watch it expand under water into a furbelowed flower furred with innumerable delicate tentaculæ, and in the centre a mouth of the most beautiful orange.

"Next, your sea-weeds, if they thrive as they ought to do, will sow their minute spores in millions around them; and these as they vegetate will form a green film on the inside of

the glass, spoiling your prospect. You may rub it off for yourself if you will, with a rag fastened to a stick; but if you wish to be saved trouble, set three or four live shells to do it for you. Look among the beds of sea-weed for a few of the bright yellow or green sea-snails, or conical tops, especially that beautiful pink one spotted with brown, which you are sure to find about shaded rock-ledges at dead low tide, and put them into the aquarium.

"You have two more enemies to guard against,—dust and heat. If the surface of the water becomes clogged with dust, the communication between it and the life-giving oxygen of the air is cut off; and then your animals are liable to die. A piece of muslin tied over the mouth of the vessel will guard against this, but a better defence is a plate of glass, raised on wire some half inch above the edge of the tank. You must guard against heat by putting a curtain of muslin or oiled paper between the vase and the sun."



KILLARNEY.

FERNS.

THERE must be few, indeed, who are indifferent to the attractions presented by a well-ordered garden, whether it be the trim little slip of ground that lies before the entrance of the humble cottage, or the closely-mown lawn, jewelled with brilliant flower-beds and bordered with evergreen shrubberies, that stretches in broad expanse before the stately mansion.

We may often draw satisfactory conclusions as to a man's general character from the condition of his garden: the well-kept piece of ground as surely betokens a man of thrifty and industrious habits, who knows what is right and practises it in all the relations and duties of life, as a ragged untidy grass plat and unkempt flower-beds, if the term be admissible, that are choked with weeds, show the owner to be an idle, careless fellow at the least, and probably a very indifferent, nay, even worthless member of society.

This is strikingly exemplified in country life, for the neatest gardens in the village will be found to belong to the most industrious and trustworthy labouring men in the district, who thus spend the few spare hours that their vocation gives them, instead of wasting them in the pot-house and the skittle-alley,

led on by the praiseworthy hope and ambition of taking a prize for the finest vegetables or the best bunch of cut flowers at the Cottagers' Horticultural Show, held yearly in his immediate neighbourhood.

And so in town life, the home that can boast of a few pots of scented mignonette and velvety auriculas, or a cage that enshrines some pretty song-bird within its wires, must be a happier one than that which is entirely destitute of Nature's adornments, while the inmates of the former must be better and more kindly affectioned towards one another in their several social relations than those that dwell in the latter. Depend upon it, that those who love birds and flowers, and dumb animals, and those whom dumb animals love, must be better, holier, and happier than those who care nothing for Nature and the countless lessons that Nature teaches. Those who begin by loving Nature and inquiring into the structure, organization, and habits of plants and animals, and the wonders of the inorganic kingdom, will soon be animated by kindlier feelings towards all around them, and end by loving "Nature's God," and doing His will in all things. Let parents try to inspire their children —the best of all "Home Pets"—with a fondness for natural science; whether it be encouraged by keeping and caring for a dog, a cat, a rabbit, a pigeon, or a song-bird; by rearing flowers; by forming an herbarium, or a collection of moths and butterflies, or by other kindred means, and they will surely be better boys and girls, and make better men and women, better members of society, and above all better Christians, than if they had been tacitly led in childhood by the example of those around them, to care for none of these things, or, in other words, encouraged to regard them with cold indifference.

But of all things whereby this practical teaching can be effected, commend me to leaves and flowers, the gems of earth and their emerald settings, or, as they are happily styled by Longfellow:

> "Stars that in earth's firmament do shine."

A few square feet of soil will furnish us with where to grow them, and a few pence will provide us with what to grow; but how many are there that dwell in "crowded cities," and "the busy haunts of men," some of whom will say, "How is it possible for us to raise and rear plants and flowers, in the damp, dingy, dreary paved courts at the back of our houses, which are seldom if ever visited by a single ray of golden sun-

light;" and others, "I have plants within the four walls that form my home and dwelling, it is true, but how can I expect them to flourish with the freshness and verdure of those that can drink in full draughts of fresh air without stint, and bask in the cheery sunshine without hindrance?" It is our present purpose to show those who live in towns and have no garden ground to call their own, that even the dark and dull back court can be made to teem with vegetation of graceful form and pleasing colour, and to prove that a Home Pet of the vegetable kingdom can be established within the realm over which they exercise lordship and mastery—even though it be bounded and encompassed by four walls, the floor, and the ceiling—which will flourish with all the freshness and brilliancy of colour of its dew-spangled relatives that wave in the lanes and hedgerows of the breezy country; while we would point out a new and charming study to those who dwell amid green fields, and show to those who are already the possessors of a coveted bit of garden ground, how an additional charm can be imparted to it by the culture of some of the beautiful varieties of the fern, whose graceful fronds never fail to meet the eye, whenever we wander through the brakes and woodlands, or over the lonely moors and by the wave-washed coast and rippling rivulets that diversify the varied scenery of the British isles.

Our subject now seems to distribute itself under certain heads into which it is needful that we should forthwith obtain some little insight. We, naturally enough, are led to inquire, "What are ferns?" "Where can we find them?" "How can we grow them to the greatest advantage out of doors?" "How can we rear them in-doors?" and "Are there any other means by which our search for ferns will furnish us with a pleasurable and instructive employment?" All these questions can be answered in a satisfactory manner, and we will at once begin with the first two queries, and find out what ferns are, and where we can find them. This of course involves some preliminary inquiry into the component parts of these plants and their manner of growth, which must be followed by a tabular arrangement of the principal British ferns, and a short description of the distinctive characteristics of each species, the localities in which they are chiefly found, the soil that they like best, and the closest imitation of it that we can make to supply our ferneries and Wardian cases, with a brief notice of the most striking varieties of some of the best known species whenever it may be required.

Following the arrangement adopted by Professor Bentley in his excellent "Manual of Botany," we find that ferns are included among the *Cryptogamia*, or plants which form one of the sub-kingdoms into which the great vegetable kingdom is divided, and which bear no flowers, but are propagated by *spores*, or organs that perform the same functions in this sub-kingdom of flowerless plants that buds and seeds perform for the higher orders of flowering plants that are classed under the opposite sub-kingdom *Phanerogamia*, or plants which show their flowers. They are also said to be *acotyledonous*, because they are developed from spores instead of seeds, in which no distinct organs of propagation can be traced, and they are *acrogenous* inasmuch as they are plants possessing distinguishable stems and leaves which have *stomata*, or pores on the surface. The place that ferns hold in the vegetable kingdom may therefore be traced thus:—VEGETABLE KINGDOM.—*Sub-Kingdom* 2. CRYPTOGAMIA.—*Class*, ACOTYLEDONES.—*Sub-Class* 1. ACROGENÆ.—*Family*, FILICES, or FERNS.

The principal component parts of ferns, in common with other plants, are the roots, the stem, and the leaves or fronds; but singularly enough, in the majority of our British ferns, the stem, technically called the *rhizome*, from which the leaves and roots spring, is concealed in the ground. In large tree-ferns that grow so luxuriantly in tropical countries, the rhizome rears itself above the ground for some feet, and resembles the gnarled trunk of a pollard ash or willow. The real roots spring from the under surface of the rhizome, and resemble rough black fibres in their general appearance; the leaves spring upwards from its upper surface, and by their different characters often serve to distinguish the *genus*, *species*, and *variety* of the plant.

When the rhizome extends horizontally below the surface of the ground, it is called a creeping rhizome, but when it rises above it, and has a rough exterior covered with broad, shaggy scales, it is termed a tufted rhizome. The *frond* is the main stem of the fern, with all the lateral branches and leaflets belonging to it; the term includes the whole leaf from its junction with the rhizome to its other extremity. The *rachis* is the main stem of the frond from the point at which the lateral branches begin to branch out from it as far as the extremity; the part that is destitute of branches between this point and the rhizome is sometimes distinguished as the *stipes*. The frond is also sometimes divided into the blade and the

stalk; the stalk being what has just been described as the stipes, and the blade, the remaining part of the frond. That portion of the stem or rachis that runs through the frond and into its minute subdivisions is called the *midrib* when it has the leaf or leaflet attached to either side of it. The *veins* branch from the midrib in straight lines; they are often forked in two branches. The organs of reproduction or spores are attached to the veins which run along the underpart of the leaf.

Different terms are applied to the frond according to its shape. When it is undivided and without indentation, as in the Hart's Tongue fern (*Scolopendrium Vulgare*), it is termed *entire*. When the frond is indented, as in the common Polypody (*Polypodium Vulgare*), but the indentations do not reach the main stem, or midrib, it is termed *pinnatifid*, which means that it has incomplete branches or leaves, the divisions of which do not reach as far as the stem. When the blade is divided into lateral branches, or leaflets, as far as the stem, the frond is termed *pinnate*, and the lateral offshoots from the main stem are called *pinnæ*. The pinnæ in their turn may be either pinnatifid, or lobed, or pinnate; and if the last-named, then the entire frond is styled *bi-pinnate*, or twice-pinnate, and the separate leaves of the pinnæ are called *pinnules*. When the fronds on the pinnæ are said to be *lobed*, which in some cases seems almost synonymous with the term pinnatifid, it is meant that the divisions of the leaf which do not reach as far as the midrib on the one hand, or the leaflets which spring from the midrib on the other, are scalloped, or indented round the edge. When the pinnæ or secondary branches of a frond are themselves also pinnate, or have lateral offshoots springing from them as far as the stem, the whole frond is called *tri-pinnate*, or thrice-pinnate. But when it is still further divided, or the tertiary branches are also pinnate, it is then termed *de-compound*. When the term *circinnate* is used, it is applied to the manner in which the fronds and pinnæ are coiled or rolled up in the bud. The *receptacle* is that portion of any vein to which the spore-cases or *thecæ* are attached. These are small vessels which contain the seed; the form of these often affords the means of determining the classification of the plant. They are collected together in little masses called *sori*, and these are sometimes covered by a membrane termed an *indusium* or *involucre*. They are always found on the under surface or the edge of the leaf; when they are in the former position they are

said to be *dorsal;* when in the latter, they are called *marginal*: they never appear on the upper surface.

As we are now supposed to be tolerably well acquainted with the structure of the fern and the different terms that are applied to its several parts, and the varied formation of the frond, let us now proceed to look through a tabular arrangement of the principal British Ferns according to their orders or groups, their genera, and their species. The order to which each belongs will be found in the first column, the genus in the second, and the species in the third; while in the fourth the name by which it is commonly known in our own language is given. An alphabetical arrangement has been adopted in the first three columns to aid the memory, and the description of the various species will, be given in this order, although greater prominence will be given to the English name than to the botanical name, which is formed of the names of the genus and species combined together. It will also be seen that one group may be composed of many distinct genera, and that each genus may include several species, which in their turn are subdivided into varieties. Thus the group *Asplenieæ* is composed of the genera *Asplenium, Ceterach,* and *Scolopendrium,* of which the genus *Asplenium* comprises as many as nine distinct species. In some cases the varieties of a single species are almost endless, and the distinctions between them are scarcely appreciable; no less than sixty-six varieties of the common Hart's Tongue fern being described in Mr. Bradbury's beautiful book entitled "Nature-Printed Ferns."

Table of the Principal British Ferns.

Order or Group.	Genus.	Species.	Common Name.
Adianteæ	Adiantum	Capillus Veneris.	*True Maiden-Hair.*
Aspidieæ	Aspidium	Aculeatum.	*Soft Prickly Shield Fern.*
		Cristatum.	*Crested Shield Fern.*
		Dilatatum.	*Spreading Shield Fern.*
		Filix Mas.	*Male Shield Fern.*
		Lonchitis.	*Holly Fern.*
		Oreopteris.	*Mountain Shield Fern.*
		Rigidum.	*Rigid Shield Fern.*
		Spinulosum.	*Broad Shield Fern.*
		Thelypteris.	*Marsh Fern.*

ORDER OR GROUP.	GENUS.	SPECIES.	COMMON NAME.
ASPLENIEÆ.	Asplenium.	Adiantum Nigrum.	*Black Spleenwort.*
		Filix Fœmina	*Lady Fern.*
		Fontanum.	*Smooth Rock Spleenwort.*
		Germanicum	*Alternate-leaved Spleenwort.*
		Lanceolatum	*Lanceolate Spleenwort.*
		Marinum	*Sea Spleenwort.*
		Ruta Muraria	*Wall Rue.*
		Septentrionale	*Forked Spleenwort.*
		Trichomanes	*Maiden-Hair Spleenwort.*
	Ceterach	Officinarum	*Scaly Spleenwort.*
	Scolopendrium	Vulgare	*Common Hart's Tongue.*
BLECHNEÆ	Blechnum.	Spicant	*Hard Fern.*
CYSTOPTERIDEÆ	Cystopteris	Fragilis	*Brittle Bladder Fern.*
		Montana	*Mountain Bladder Fern.*
GYMNOGRAMMEÆ	Gymnogramma.	Leptophylla	*Fine-leaved Gymnogramma.*
HYMENOPHYLLEÆ	Hymenophyllum	Tunbridgense	*Filmy Fern.*
		Wilsoni	*Wilson's Filmy Fern.*
	Trichomanes	Brevisetum	*Bristle Fern.*
OPHIOGLOSSACEÆ	Botrychium	Lunaria	*Moonwort.*
	Ophioglossum	Lusitanicum	*Lesser Adder's Tongue.*
		Vulgatum	*Common Adder's Tongue.*
OSMUNDACEÆ	Osmunda	Regalis	*Royal Fern.*
POLYPODIACEÆ	Allosorus	Crispus	*Parsley Fern.*
	Polypodium	Alpestre	*Alpine Polypody.*
		Calcareum.	*Limestone Polypody.*
		Dryopteris.	*Oak Fern.*
		Phegopteris	*Beech Fern.*
		Vulgare	*Common Polypody.*
PTERIDEÆ	Pteris.	Aquilina	*Brake or Eagle Fern.*
WOODSIEÆ	Woodsia	Ilvensis	*Oblong Woodsia.*
		Ilvensis Hyperborea	*Alpine Fern.*

From the above tabular arrangement, we find that there are forty-one different species of British ferns, distributed among

seventeen genera, which, in their turn, are grouped into twelve distinct families. The same fern is sometimes designated by different common, or English, names, and far too often by different botanical names; but the greater number of these will be included in its description, and the varieties of every species that call for especial notice will be mentioned, as it has been said, in connection with the species to which they belong.

I. ADIANTEÆ.

1. True Maiden Hair (*Adiantum Capillus Veneris*). Pl. 4

In common with many others, the True Maiden Hair is the only species of the family to which it belongs that is known in the British Isles. The plant is small and delicate in appearance, but singularly graceful and elegant in form. The length of the frond varies from six to twelve inches. From a rough and scaly rhizome of a dark colour, which is rooted to the earth by black fibrous roots, spring a number of black stems almost as fine as hair. On the slender stalks that branch from these stems, small fan-shaped leaflets tremble in the breeze. The edges of the leaves are indented; those of the seed-bearing leaves are slightly curled, and wrap over the *sori*, or seed-receptacles that lie along the margin of the underpart of the leaf. It is found in the greatest abundance in Devon and Cornwall, Glamorganshire, the south of Ireland, and the Arran Isles. It grows in damp places, and flourishes on rocks near the seashore, where it is washed and nourished by the salt spray. When transplanted, it will thrive in a Wardian case, in any receptacle filled with pieces of sandstone, and a mixture of sand, loam, and a little decayed vegetable matter.

II. ASPIDIEÆ.

1. Prickly Shield Fern (*Aspidium Aculeatum*). Pl. 1.

A beautiful fern, having seven or eight large leaves from one to two feet in length, springing in a circle from a short rough rhizome, and curling outwards. The stem of the frond or leaf, near the rhizome, is covered with rough reddish scales. The *pinnæ*, or stems growing laterally from the main stem, spring from it alternately. The *pinnules*, or little leaves springing from the pinna, are serrated, and have a broad pointed piece projecting from the base of each on one side. The seed-receptacles are circular, and covered with an indusium, or outer

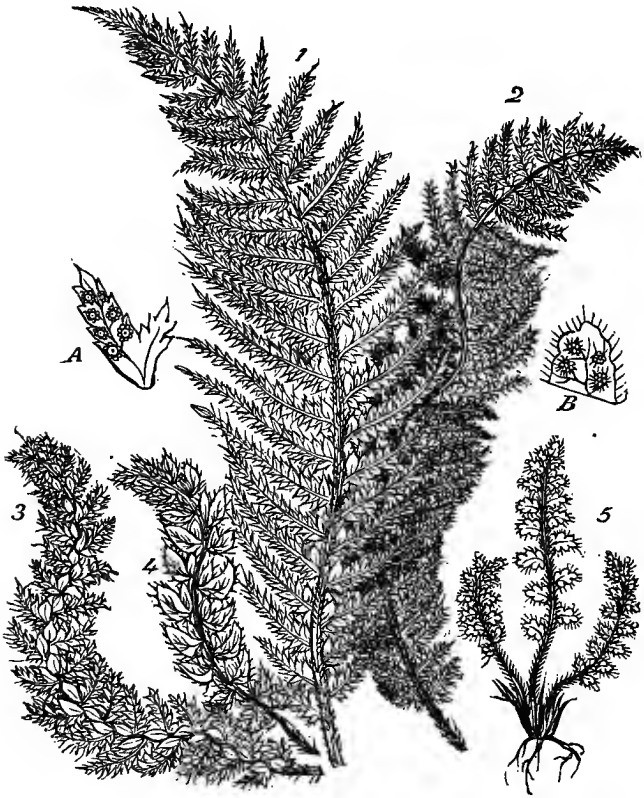


PLATE 1.—1, Prickley Shield Fern. A, Pinnule of do. 2, Variety of do. *Aspidium Aculeatum Angulare.* 3, Variety of do. *Aspidium Acuceatum Lobatum.* 4, Holly Fern. 5, Alpine Fern. B, Part of Frond of do. enlarged.

envelope, attached to the leaf by a central fibre. They are ranged in two rows, one on either side of the midrib of the pinnules growing towards the extremity of the pinnæ. It is a hardy evergreen fern, the fronds of successive years appearing in marked contrast on the same rhizome. It grows in all parts of Great Britain and Ireland, and may be found in almost every hedgerow. This fern is also known by the generic names

of *Polypodium* and *Polystichum Aculeatum*. The varieties are termed *Aspidium Aculeatum Angulare*, which is larger, and *Aspidium Aculeatum Lobatum*, the fronds of which are not so long as those of *Aspidium Aculeatum*, but the leaflets at the base of the pinnæ are larger, and lobed.

2. Crested Shield Fern (*Aspidium Cristatum*). Pl. 6.

This fern has three or four long and erect fronds, two or three feet in length, rising from the crowns of the branches of the rhizome. They are pinnate, and the pinnæ spring from opposite points on either side of the main stem, and grow less and less in length as they approach the end of the frond. The pinnæ are deeply indented or pinnatifid. The sori are in rows on either side of the midrib of the pinnæ, and halfway between it and the edge of the leaflet. The seed-covers are circular and plain in shape. It is said to be found principally in Norfolk, Suffolk, Cheshire, and Nottinghamshire, and in parts of Scotland and Ireland. It thrives in peaty soil, and does not require to be grown under glass. It is also known by the botanical names, *Lastrea Cristata*, *Polypodium Cristatum*, *Polypodium Callipteris*, and *Lophodium Callipteris*.

3. Spreading Shield Fern (*Aspidium Dilatatum*). Pl. 6.

The leaves of this fern spring from a strong tufted rhizome, that often rises many inches above the surface of the ground. The leaves are pinnate, and spring from points on either side of the main stem that are nearly opposite to each other; those which spring from the central part of the stem are longer than the rest. The pinnulæ are lobed; the sori are on either side of the midrib of the imperfect leaflets or lobes of the pinnulæ, and the indusia are notched. It is one of the most common of the British ferns, and may be found in any wood or hedgerow. Specimens often differ considerably from each other in form. It is also known as the Broad Prickly Toothed, or Crested Fern, and its other botanical names are *Lastrea Dilatata*, *Aspidium Spinulosum*, and *Lophodium Multiflorum*.

4. Male Shield Fern (*Aspidium Filix Mas*). Pl. 6.

This is a strong, free-growing, pinnate fern, common in all parts of England. The fronds, which grow from a rough rhizome in the form of a coronal, are about five or six in number, and of the average length of two feet. The stalks of

the fronds are rough. The pinnæ are lobed; those which grow from the central part of the main stem are longer than the rest. The sori are large and clustered on either side of the veins of the slightly indented lobes of the pinnæ. The indusia are kidney-shaped, and very prominent. It thrives in rich sandy loam, and is the only fern used at present in medicine; it is sometimes used in brewing as a substitute for hops.

Its other botanical names are *Lastrea F. M.* and *Dryopteris F. M.* Its varieties are termed *A. F. M. Abbreviata, Incisa, Paleacea,* and *Pumila;* the first and fourth are smaller than the type of the species; the second larger, with bi-pinnate fronds; the third has fronds of a golden hue, with purplish veins

5. Holly Fern (*Aspidium Lonchitis*). Pl. 1.

A dark green fern, with stiff stems to the pinnate fronds, which are rough and prickly in appearance, having spines round the edges of the leaflets, which have a projection at the base on one side of the midrib, that gives them a crescent-shaped form. The fronds vary from six to eighteen inches in length, and grow from the rhizome in a tuft. The sori are circular, and on either side of the midrib of the leaflets at the upper end of the frond. It is found in rocky districts in Wales, Ireland, and Scotland, but it is a matter of great difficulty to grow it in ferneries. This fern is sometimes called the Rough Alpine Shield Fern, and by the botanical names *Polypodium Lonchitis,* and *Polystichum Lonchitis.*

6. Mountain Shield Fern (*Aspidium Oreopteris*). Pl. 6.

A fern very like the Male Shield Fern in form, with fronds shaped liked the head of a spear. The pinnæ are pinnatifid, and grow from points nearly opposite to each other, on opposite sides of the rachis. The sori are circular, and ranged round the edges of the lobes of the pinnæ. The fronds attain the average length of two or three feet. It is difficult to rear this fern, it soon withers out of doors, and is not suitable for a case, as it requires constant watering. It is found in parts of the south and south-east of England, and in Scotland. Its botanical synonyms are *Lastrea Oreopteris* and *Polypodium Fragrans,* and it is sometimes called the Heath Shield Fern.

7. Rigid Shield Fern (*Aspidium Rigidum*). Pl. 6.

An upright fern, with bi-pinnate fronds about a foot in length: the pinnæ gradually decrease in length from the base to

the extremity, and the leaflets are lobed. The stipes of the frond is rough. The fronds grow from a tufted rhizome, which appears just above the surface. The sori are circular, and on the veins on either side of the midrib of the leaflets. It is chiefly found in the limestone districts of the north of England: it flourishes in ordinary soil, but requires moisture. It emits a fragrant smell when bruised, like the Mountain Shield Fern. It is also called *Lastrea Rigida*, and *Lophodium Rigidum*.

8. Broad Shield Fern (*Aspidium Spinulosum*). Pl. 6.

A fern that much resembles the Spreading Shield Fern. The fronds are generally bi-pinnate, and vary from one to two feet in length; the pinnæ are lobed or deeply indented, and in some cases bi-pinnate, making the entire frond tri-pinnate. The sori are circular, and scattered on either side of the midrib of the pinnules; the kidney-shaped indusia are plain instead of being notched, as in the Spreading Shield Fern, and this is one of the chief marks of difference between them. It is found in the Midland Counties, and near London. It grows in peaty soil, but requires shade and moisture. Its botanical names are numerous—*Lastrea Spinosa*, and *Fœnisecii*, *Lophodium Uliginosum*, and *Aspidium Recurvum*. Its chief variety is *A. S. Recurvum*, the pinnulæ of which have curved points along the edges.

9. Marsh Fern (*Aspidium Thelypteris*). Pl. 6.

This fern is distinguished by single, upright, pale green pinnate fronds, growing from a creeping rhizome to a height varying from six inches to three feet. The pinnæ are pinnatifid, and the margins perfectly plain. The sori are midway between the midrib and edge of the lobes. The kidney-shaped indusia are thin, and soon disappear. It grows in marshy soil in almost every part of England. When transplanted it should be placed in peat, or a light compost of leaf-mould and charcoal, and kept very moist. It has been variously styled by botanists *Lastrea Thelypteris*, *Hemestheum T.*, *Polypodium T.*, *Acrosticum T.*, and *Polystichum T.*

III. ASPLENIEÆ.

1. Black Spleenwort (*Asplenium Adiantum Nigrum*). Pl. 2.

The height of the thick dark glossy green fronds of this fern varies from six to twenty inches: they are either bi-pinnate or tri-pinnate, and generally triangular in form. The stem is of

PLATE 2.—1, Alternate Leaved Spleenwort. 2, Forked Spleenwort. 3, Smooth Rock Spleenwort. 4, Sea Spleenwort. 5, Lanceolate Spleenwort. 6, Black Spleenwort. 7, Maiden Hair Spleenwort. A, Pinna of do., enlarged. 8, Green Spleenwort. 9, Wall Rue.

a purple colour. The oblong sori are on either side of the midrib of the pinnules, diverging alternately from it. The pinnæ grow alternately from the main stem, and the pinnulæ are also alternate. It grows in the shade on old walls, ruins, and hedgerows in all parts of England, and thrives in common soil when removed, but requires shade and moisture.

2. Lady Fern (*Asplenium Filix Fœmina*). Pl. 3.

A delicate, beautifully formed, bright green fern, very much like the Male Fern, but slighter, and not so tall. The fronds vary from six to thirty inches in length; they are spear-shaped and bi-pinnate. The pinnæ are deeply lobed, and the margins are notched. The sori are very abundant, oblong in shape, and diverging alternately from the midrib. The pinnæ and pinnulæ grow alternately from the stem. It is found in all parts of the British isles. It will thrive in ordinary soil, but some peat or charcoal and freestone should be mixed with it. It likes shade and moisture. Its synonyms are *Athyrium*, *Aspidium*, or *Polypodium Filix Fœmina*. The varieties are numerous; they are smaller than the true Lady Fern; the principal are distinguished as *Latifolium*, *Molle*, and *Crispum*.

3. Smooth Rock Spleenwort (*Asplenium Fontanum*). Pl. 2.

The bi-pinnate fronds of this rare fern grow in tufts, and are from four to eight inches in height. The stalk is dark brown, the pinnæ and pinnules growing from opposite sides of the stem alternately. The pinnules are broad, and deeply indented at the extremity. The sori are grouped in masses at the base of each pinnule. It is chiefly found in Derbyshire and Scotland. A little sandstone should be added to the soil in which it is grown. It requires shade and moisture, and is well suited for Wardian cases. It has been called *Aspidium*, *Athyrium*, and *Polypodium Fontanum*.

4. Alternate Leaved Spleenwort (*Asplenium Germanicum*). Pl. 2.

A fern more rare than the preceding, which it resembles. The fronds grow in tufts; the pinnæ are long and narrow at the base, springing alternately from the main stem; they grow broader towards the extremity, which is indented. The sori diverge from the centre of the under part of the pinnæ. It has been found in Scotland. When it is grown in a case, the soil should be well drained, for it dislikes moisture. It is also called *Amesium Germanicum*, and *Asplenium Alternifolium*.

5. Lanceolate Spleenwort (*Asplenium Lanceolatum*). Pl. 2.

The fronds of this fern are from six to twelve inches in height. They are bi-pinnate, and the pinnules or leaflets are ovate and indented. The oblong sori lie round the edge of the

pinnules. It is found in damp places on the south coast of England, and especially in Devon and Cornwall. It will grow in common soil in a case or green-house. The roots should be kept free from too much moisture by drainage. It is sometimes called Hudson's Spleenwort.

6. Sea Spleenwort (*Asplenium Marinum*). Pl. 2.

The fronds of this species are from six to fourteen inches in height. They are pinnate, and grow in tufts. The pinnæ assume the form of broad oval leaves slightly lobed, and serrated at the edge. The large oval sori diverge from the midrib of the pinnæ on either side. It is found in many places along the coast, but more abundantly in Devon, Cornwall, and the Channel Islands. Peat, silver sand, charcoal, and lumps of freestone should be mixed with the soil in which it is grown.

7. Wall Rue (*Asplenium Ruta Muraria*). Pl. 2.

A pretty little fern that grows in thick close tufts on old walls and rocks. The fronds are about three or four inches in length. They are bi-pinnate. The stem and stalks of the leaflets are very fine and delicate. The leaflets vary in form, but they are commonly fan-shaped, and notched along the upper extremity. The sori occur in irregular patches in the centre of the leaflet. It is to be found in any part of England on old walls, but the tenacity of its roots renders its removal a matter of difficulty. Sandy peat, mortar, and rubbish should be mixed with the soil in which it is grown. It requires shelter and moisture.

8. Forked Spleenwort (*Asplenium Septentrionale*). Pl. 2.

A fern of singular appearance, the fronds growing in tufts, but resembling a forked blade of grass with a jagged margin. The sori are placed all along the midrib on either side. The fronds are from two to four inches long. It has been found in Wales, the South of England, Scotland, and Somersetshire, but it is considered a rare species. It should be grown under a glass in peaty soil, mixed with a little charcoal and mortar, and kept well drained.

9. Maiden Hair Spleenwort (*Asplenium Trichomanes*). Pl. 2.

This species, like many of the preceding, grows luxuriantly from the rhizome in tufts. Its deep green pinnate fronds are from four to twelve inches in length. The stem is black and

slender; the pinnæ ovate with an indented margin. The sori are under elongated indusia diverging from the midrib of the pinnæ. It is found in almost every part of the British isles, on rocks and old walls, in damp situations. The roots should be kept free from moisture when transplanted, and the plant grown in sandy mould, mixed with charcoal and old mortar. It is suitable for the upper parts of rockwork. It is sometimes called the Common Spleenwort. There is a variety of this species, the Green Spleenwort, *Asplenium Trichomanes Viride*, found in Wales, Scotland, and the North of England; in this the stipes only is dark, the rest of the stem is green.

10. Scaly Spleenwort (*Ceterach Officinarum*). Pl. 5.

This fern has thick light green fronds, slightly pinnatifid or lobed, and from four to eight inches long, growing from a bulb-shaped rhizome in large tufts. The upper-part of the leaf is smooth, but the under part is rough, with brown fibrous scales under which the sori are hidden. It is found on old walls and ruins, and on rocks. It requires shade, and thrives in common soil, mixed with old mortar and peat. Its other botanical names are *Scolopendrium, Graminitis*, and *Asplenium Ceterach.*

11. Common Hart's Tongue (*Scolopendrium Vulgare*). Pl. 3.

The fronds of this common and hardy evergreen fern grow in clusters. They are entire and tongue-shaped, being from six inches to two feet in length: the margin is slightly wavy in outline. The sori are linear, lying along the veins that diverge angularly from the midrib. It is found in all parts of Great Britain, chiefly in damp and shady situations, and on walls, on rocks, and in hedgerows. It will grow anywhere, and thrives in common soil. It requires plenty of moisture. The leaf assumes many different shapes, and consequently the varieties are numerous. The principal are distinguished as *Crispum, Lacertum*, and *Multifidum*; the first has a wavy edge to the frond, the second a short but broad pinnatifid frond, and the third a forked frond.

IV. BLECHNEÆ.

1. Hard Fern (*Blechnum Spicant*). Pl. 3.

This fern throws up its fronds in a cluster from a tufted rhizome. In the centre, three or four fertile fronds stand erect,

PLATE 3.—1, Brittle Bladder Fern. A, Part of Pinnule of do., enlarged. 2, 3, Varieties of do., *Cystopteris Dentata* and *Cystopteris Dickieana*. 4, Lady Fern. B, Pinnule of do., enlarged. 5, Common Hart's Tongue. C, Seed-vessel of do. 6, Hard Fern. D, Lobe of do.

surrounded by barren fronds, that droop or lie flat on the ground. The former are about twelve inches high, and deeply pinnatifid; the latter are about half as long again, and the lobes are broader. The sori are linear, on either side of the midrib of the lobes of the fertile fronds, which decay and disappear in winter, while the barren fronds are evergreen. It is sometimes

called the Fox fern. Its botanical synonyms are *Blechnum Boreale*, and *Lomaria* and *Osmunda Spicant.*

V. CYSTOPTERIDÆ.

1. Brittle Bladder Fern (*Cystopteris Fragilis*). Pl. 3.

A delicate fragile fern of elegant appearance. Its feathery fronds are bi-pinnate and spear-shaped, the stipes and stem being of a dark colour. The circular sori are covered with delicate white indusia, attached to veins branching from the midrib of the pinnules. It is commonly found in England and Scotland, in damp situations, on walls and rocks, and generally in the vicinity of water. It grows readily in the open air, or in cases, but requires drainage and plenty of water. Its other botanical names are *Cystea* and *Cyathea Fragilis.* Its varieties are distinguished as *Dentata*, which is smaller and has the pinnules rounded at the extremity, and *Dickieana*, with short broad and pinnatifid pinnæ.

2. Mountain Bladder Fern (*Cystopteris Montana*).

The fronds of this fern are triangular in form and bi-pinnate; they are from four to eight inches in length, and the pinnæ are long in proportion; the pinnules are deeply indented and serrated. It is a delicately-formed plant, and very scarce. It is found in some parts of England, and somewhat resembles the Limestone Polypody in form. It is known by the botanical names *Cystopteris Myrrhidifolium* and *Polypodium* and *Aspidium Montanum.*

VI. GYMNOGRAMMEÆ.

1. Fine-Leaved Gymnogramma (*Gymnogramma Leptophylla*). Pl. 5.

A scarce and delicate little fern, with bi-pinnate fronds, from three to six inches in length. The pinnæ are thrice-lobed and serrated. The rachis is black, the sori abundant, oblong, but without indusia. It is found in Jersey and is supposed to grow in Devonshire. It likes a light sandy soil and plenty of moisture.

VII. HYMENOPHYLLEÆ.

1. Filmy Fern (*Hymenophyllum Tunbridgense*). Pl. 4.

A delicate and fragile fern growing in tufts. It has pinnate fronds of a brownish colour. The thin membranous pinnæ,

with their strongly-marked veins, are narrow at the base and increase in breadth towards the extremity; they are fan-shaped and split into long narrow leaflets, which somewhat resemble fingers projecting from the palm of a human hand. The sori are urn-shaped, and situated at the base of the pinnæ, on a membrane that extends from them along the side of the rachis. It is found in many parts of the British isles, in shady situations, and may be grown in close cases, in a compound of peat and sandy loam. Its other botanical name is *Trichomanes Tunbridgense.*

2. WILSON'S FILMY FERN (*Hymenophyllum Wilsoni*). PL. 4.

A fern very like the former in general character, but its colour is dark green, and the leaflets of the pinnæ are curved in a downward direction. The sori are also more distinct from the membrane at the base of the pinnæ. It is found in Westmoreland, but is by no means a common fern in the British isles. It may be grown in the same manner as the Filmy fern. Its synonym is *Hymenophyllum Unilaterale.*

3. BRISTLE FERN (*Trichomanes Brevisetum*). PL. 4.

A fern with tri-pinnate fronds of brilliant green growing from its creeping pendent rhizome. The pinnules are deeply cut into leaflets of different forms, and the urn-shaped seed-vessels are situated in these deep clefts, and have a bristle projecting from the centre. It is found in the south of Ireland and in great abundance at the lakes of Killarney. It should be grown in a case and watered frequently, but the soil should be well drained. It is also known by the names of *Trichomanes Alatum, Radicans, Pyxidiferum* and *Speciosum.*

VIII. OPHIOGLOSSACEÆ.

1. MOONWORT (*Botrychium Lunaria*). PL. 4.

A fern of very singular appearance. Each single stem separates into two branches, one of which is thick and furnished with a row of crescent-shaped indented pinnæ on either side, marked with a dark semicircle resembling a horse-shoe, while the other is a thin spike devoid of leaflets, and bearing the seed-cases clustered at the top. The frond is about six or eight inches in length. It is found in all parts of England, Scotland, and Ireland, but chiefly in Yorkshire, Surrey, and Staffordshire. It should be grown in peaty soil, in a dry situation, and in the open air. It is also called *Osmunda Lunaria.*

Plate 4.—1, Brake, or Eagle Fern. A, Lobe of Pinnule of do. 2, Parsley Fern B, Lobe of do. (fertile leaf). 3, True Maiden Hair. C, Pinnule of do. 4, Filmy Fern. D, Lobe of do. 5, Wilson's Filmy Fern. 6, Bristle Fern. E, Lobe of do. 7, Royal Fern. F, Seed-vessel of do. 8, Moonwort. G, Sori of do. 9, Common Adder's Tongue. H, Sori of do.

2. Lesser Adder's Tongue (*Ophioglossum Lusitanicum*).

A fern resembling the Arum, or plant called "Cuckoo Pint." A broad green ovate frond envelops a spike projecting from its folds, with lines of sori at its summit. It is only two or three

inches in height, and is indigenous to the Channel Islands. It may be grown out of doors in fine loamy soil.

3. Common Adder's Tongue (*Ophioglossum Vulgatum*). Pl. 4.

A fern which exactly resembles the preceding in general structure. It is, however, larger, being six or eight inches in height. It is found in all parts of England, and occasionally in Scotland and Ireland. It grows in meadows and moist situations. It may be readily reared in loamy soil, but requires shade and frequent watering.

IX. OSMUNDACEÆ.

1. Royal Fern (*Osmunda Regalis*). Pl. 4.

The largest of the British ferns, and the most magnificent in appearance. Its height, when growing in a wild state, varies from three to seven, or even eight feet. The fronds are bi-pinnate, the pinnæ are spear-shaped, and the pinnulæ somewhat ovate—broad at the base, and terminating in a blunted point. The stems of the pinnules, at the upper part of the frond, are covered with thick clusters of sori, which resemble spikes of brown flowers. It is found in marshy land in Lancashire, Cornwall, and many parts of England, and at Killarney, and in the south of Ireland. It may be grown in peaty soil, in any shady and moist situation; but it must be well watered. It is sometimes called the Flowering Fern.

X. POLYPODIACEÆ.

1. Parsley Fern (*Allosorus Crispus*). Pl. 4.

A little fern, with bright green fronds resembling the leaves of parsley. The fronds vary in height from six to ten inches; the fertile and barren ones differing in shape. The former are tri-pinnate, and the leaflets are oblong, with the edges bent back over the indusia, which are placed on the margin of the under part of the leaflet. The latter are also tri-pinnate in parts, and the leaflets are deeply lobed and indented. It grows among rocks, and is generally found in stony and mountainous districts in the north of England, and in parts of Wales, Scotland, and Ireland. It is sometimes grown in a case, but requires good drainage; when grown out of doors, peat, stones, and old mortar should be mixed with the soil in which it is placed. It is well suited for the rockery. It is also called Rock Brake and Mountain Parsley, and known by the botanical

names, *Pteris, Cryptogramma,* and *Osmunda Crispa, Phorobolus Onocleoides,* and *Stegania Onoclea Crispa.*

2. Alpine Polypody (*Polypodium Alpestre*). Pl. 5.

The fronds of this fern vary from twelve to eighteen inches in length. They spring from a thick tufted rhizome, and are spear-shaped and bi-pinnate: the pinnules are deeply lobed, and the edges are serrated. The sori are circular and without indusia, situated on either side of the midrib of the pinnules. It is only found in the Highlands of Scotland. It may be grown out of doors in a shady situation, and in loose peaty soil. It somewhat resembles the Lady Fern in general appearance. It is termed *Pseudathyrium Alpestre* by Newman.

3. Limestone Polypody (*Polypodium Calcareum*). Pl. 5.

Each frond of this fern has three branches, one being a continuation of the stem, and the others diverging from it on either side, very nearly at right angles. The pinnæ of the branches are deeply lobed or pinnatifid, and the sori are placed close together along the edge of the under part of the leaflet. It is of a dark green colour, and the fronds are covered with minute glands on fine stems, which give it a powdery appearance. It is found in the limestone districts of the northern counties of England. It must be kept dry, and grown in common soil, mixed with lime and rubbish.

4. Oak Fern (*Polypodium Dryopteris*). Pl. 5.

A fern very similar to the Limestone Polypody in general character and length of the frond, which is from four to fourteen inches. The stipes is slender, purple, and scaly at the base. The lobes of the pinnæ are not so deeply cut, but blunted at the point; the sori are placed at intervals along their edges. It is found in moist situations in the north of England, Wales, and Scotland. It may be grown in common soil, and is well suited for rockwork. It requires shade, and frequent watering, but the roots should be kept well drained.

5. Beech Fern (*Polypodium Phegopteris*). Pl. 5.

A fern with fronds pinnate at the base, and pinnatifid towards the extremity. The stipes is very long, in proportion to the entire length of the frond from the rhizome, which varies from five to twelve inches. The lower pinnæ droop towards the stipes, the rest turn upwards. The little naked

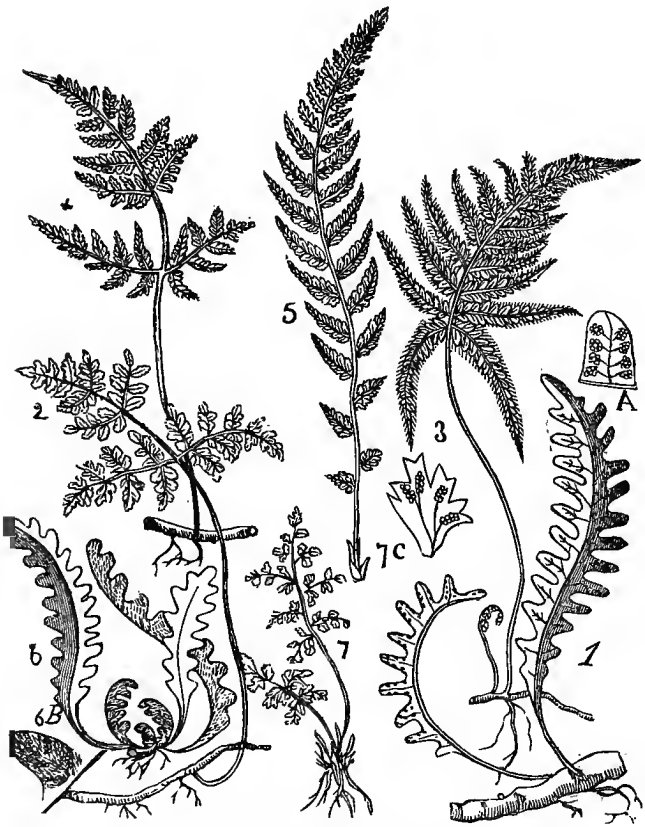


PLATE 5.—1, Common Polypody. A, Seed-vessels of do. 2, Oak Fern. 3, Beech Fern. 4, Limestone Polypody. 5, Alpine Polypody. 6, Scaly Spleenwort. B, Underside of a lobe of do. 7, Fine-leaved Gymnogramma. C, Pinnule of do.

sori are on the edges of the lobes of the pinnæ, which are hairy on the under side. It is found in damp wet situations in the south and west of England. It may be grown in a compost of peat, sand, and charcoal, and requires shade and constant watering. It is sometimes called Mountain Polypody, and *Polystichum Lastrea* or *Gymnocarpum Phegopteris* by botanists.

6. Common Polypody (*Polypodium Vulgare*). Pl. 5.

A fern with bright green fronds springing from a thick rhizome. They are drooping and slightly spear-shaped, and deeply pinnatifid. The sori are placed on either side of the midrib of the long pointed lobes. It is common in all parts of the British isles, and grows on old walls, rocks, and the decaying trunks of trees. It should be grown in light soil, mixed with charcoal and vegetable mould. Newman calls it *Ctenopteris Vulgaris.*

XI. PTERIDEÆ.

1. Brake or Eagle Fern (*Pteris Aquilina*). Pl. 4.

A tall fern, with fronds varying from two to five or six feet in height. They grow singly, and there is a great space between the points where the pairs of pinnæ branch from the main stem. The pinnæ are bi-pinnate, and the pinnules deeply cut into pointed lobes, on the margin of which the sori are clustered. They are to be found in any brake, wood, or moorland district. The dark fibres, running through the stem longitudinally, present a curious configuration, known as "King Charles's Oak," or "King Charles in the Oak," when that part of the stem which is below the ground is cut transversely. Potash is made from it, and it is used for packing fish and fruit, littering horses and pigs, and even for thatching sheds in Scotland. Newman calls it *Eupteris Aquilina.* The name "Aquilina" is given to it because some have imagined the figure in the stem above mentioned to resemble a spread eagle.

XII. WOODSIEÆ.

1. Oblong Woodsia (*Woodsia Ilwensis*).

A little fern, with pinnate fronds from two to four inches in length, growing in thick tufts. The pinnæ are pinnatifid, with an indented margin; the surface is covered with red, dark brown hairs, which are thicker in the under part and almost conceal the sori. It is very scarce; growing in the clefts of rocks in a few mountainous districts of Great Britain. It may be reared in common soil. They do not thrive under glass; but require shade, very little moisture, and protection for the rhizome through the winter, when grown in the open air. It is also called *Ray's Woodsia*, and *Acrostichum* and *Polypodium Ilvense*, and *Polypodium Arvonicum*, by botanists.

2. ALPINE FERN (*Woodsia Ilvensis Hyperborea*). PL. 1.

A fern somewhat like the preceding, but the pinnæ do not spring from opposite points on either side of the stem, they are not so hairy, nor so deeply indented along the margin. It is found in rocky districts, but is extremely rare. It requires the same mode of culture as the Oblong Woodsia. It is sometimes called Bolton's Woodsia, and is termed *Woodsia Alpina* by Newman.

It may be reasonably concluded, that any reader who has carefully studied the foregoing pages will have obtained some idea of the chief characteristics of the principal species of British ferns that are known to collectors, and, with the aid of the engravings, will be able to distinguish and name any fern that he or she may take tenderly from its native soil to adorn the rockery or Wardian case with its rich green, glossy fronds. It may be objected, however, that too much care has been taken to register the several botanical names of each separate species; but this has been done to endeavour to clear away the clouds of doubt and difficulty with which the mind of any one who is commencing the study of ferns will naturally be overcast when it is found that the same plant is spoken of by three or four different botanists under as many different names.

It has been impossible to do more than broadly indicate the locality in which each species may be found; but in whatever part of the United Kingdom the collector may be, the nearest bit of tangled brake or bosky woodland, the marsh and meadow glittering with king-cups, and the yellow blooms of the flag, the distant moorland that breaks the grey horizon with its granite tors, the craggy summit and the mountain side, the crumbling walls of ivy-mantled ruins, the clear, cool village well, and even the churchyard where the quiet dead lie changing into dust, will always furnish specimens that will amply repay the closest search.

In removing a fern to transplant it to the fernery, it will be always necessary to take away a sufficient quantity of the rhizome on either side of the stem of the frond to insure its growth if it be one that creeps below the surface of the ground. The soil about the roots should be disturbed as little as possible. As soon as it has been taken up, the roots and rhizome should be surrounded with wet moss, or some damp envelope, and carefully stored in a tin case or basket, and before leaving the

place from which our specimen has been taken, we should carefully note the aspect and situation, as well as the kind of soil in which it has been growing. Our future success in making our fernery, and in stocking our Wardian cases, depends entirely upon this. Some ferns, by their hardy nature, are better suited for growing in the open air; others, on the contrary, require to be raised in pots, or under a protective covering of glass; but it is not sufficient only to consider for which of these purposes the fern we have removed may be best adapted; a fern that has been accustomed to shade cannot be expected to thrive in a flood of sunshine; the stately Flowering Fern will not flourish on the well-drained summit of a rockery, nor will the Limestone Polypody thrive in the marshy soil that is so congenial to the former: we must, therefore, in all cases carefully mark the nature of the ground in which our fern has been growing, and all the peculiarities of its habitat, that the position and character of the soil into which we are about to move it may resemble them as closely as the artificial means at our disposal will admit.

Ferns may be propagated by seed as well as by removing a portion of the rhizome with the crown, from which the frond springs. The leaf should be allowed to dry, after which the seed-vessels must be rubbed away from the back of the leaf, where they will be found in every description of fern except the *Osmundaceæ* and the *Ophioglossaceæ*. The seed may be mixed with a little fine dry mould, and sprinkled over the interstices of the rockwork, or it may be grown in pots filled with peaty earth and covered with a handglass. The light should be excluded in the latter case until the seed has begun to germinate.

We have now to inquire how we can grow our ferns to the best advantage out of doors, and how we can rear them indoors. The fernery in the open air may be made in rockwork, or consist of an open shed formed of rough trunks of trees set up at the angles, with a trellissed roof of gnarled oak loppings covered with creepers to exclude the sun's mid-day rays. Within doors they must be reared in pots, or in close Wardian cases.

In constructing a fernery in the open air, we must be guided by circumstances to a very great extent. If we have an ample piece of garden ground at our disposal, either the rockwork or fern-shed may form an admirable means of masking some unsightly corner; but if we have only a small dark court

within high walls wherein to indulge our fancy for fern-growing, we must perforce content ourselves with a little rockwork along the sides and in the angles, or in the centre if it be large enough, as there will be sufficient shade without attempting to procure it artificially by the roof of the shed.

The following is the method of making rockwork for the reception of ferns. A quantity of broken tiles, rubbish, and old mortar should be first thrown together in the form which we wish our structure to assume; this both serves as a foundation for the superincumbent mass, and affords the means of keeping the upper portion well drained. The interstices in this heap of rubbish may be filled, as we proceed, with rough sand and gravel. A thick layer of compost, formed of loam, peat, sand, old mortar, and charcoal, should be spread over this heap, and the exterior faced with dark pieces of rock and clinkers, blocks of grey limestone, and rough white flints piled together in an artistic manner, devoid of anything approaching formality. The compost that has just been named will do well enough for any kind of fern as far as general purposes are concerned, but each interstice between the stones should be lightly filled with the particular compost that is best suited for the fern that is destined to grow there, after which the rhizomes must be carefully planted.

Rockwork in a close court that is seldom visited by sunshine, will retain its moisture for a considerable time, but arrangements should be made to furnish the garden rockery with a constant supply from a perforated pipe, or a fountain should be made in its vicinity, which will throw a perpetual sprinkle of spray over those plants whose fronds constantly require the refreshing shower; but if these means are not available, it must be kept well watered with the watering-pot or garden-engine. For such plants as the Flowering Fern and Marsh Fern, that thrive best in marshy land, and require the soil about their roots to be always well saturated with water, pits should be made in convenient corners of the fernery, lined with puddled clay, to prevent the water from soaking away, and filled with peat or bog earth.

The rockery in the garden should be so situated that one side may be kept in constant shadow, and to secure this, advantage should be taken of any portion of the garden wall that happens to be placed in a convenient position to afford the necessary shade, or it should be gained by planting shrubs to intercept the sun's rays. This is more readily and pic-

turesquely managed in the-fern shed, which may be raised near a clump of trees, or may be itself constructed so as to afford the necessary shadow. When the four unbarked trunks of trees have been reared at the angles and the open roof of knotted oaken boughs thrown over the space between them, the side that looks towards the east may be filled up with a trellis similarly made and covered with creepers like the roof itself. Masses of hardy ferns should be grouped round the base of each wooden pier, a bank covered with rockwork should be raised in the centre of the shed, for the reception of the more delicate species, and puddled pits filled with peat should be sunk in convenient situations for the plants that love continual moisture about the roots. The cost of such a fernery as this would be but trifling in proportion to the pleasing effect that would be obtained, and the whole structure, crowned, wreathed, and studded with every tint of green, would afford a cool retreat from the sultry summer sun.

The following are lists of ferns, grouped according to their fitness for cultivation, either in the open air without any protection whatever, or in pots that may be taken into a warmer or cooler atmosphere at pleasure, or in Wardian cases.

1. *Ferns fit for open-air culture.*—Male Shield Fern, Mountain Shield Fern, Marsh Fern, Lady Fern, Hard Fern, Oak Fern, Brake or Eagle Fern (*north aspect*), Broad Shield Fern, Common Hart's Tongue, Royal Fern, Parsley Fern, Limestone Polypody, Common Polypody (*south and east aspect*), Crested Shield Fern, Spreading Shield Fern, Soft Prickly Shield Fern, Black Spleenwort, Maiden Hair Spleenwort, Scaly Spleenwort, Moonwort, Common Adder's Tongue (*west aspect*).

2. *Ferns adapted for culture in pots.*—True Maiden Hair, Crested Shield Fern, Mountain Shield Fern, Holly Fern, Marsh Fern, Black Spleenwort, Lady Fern, Smooth Rock Spleenwort, Lanceolate Spleenwort, Sea Spleenwort, Wall Rue, Forked Spleenwort, Maiden Hair Spleenwort, Scaly Spleenwort, Common Hart's Tongue, Hard Fern, Parsley Fern, Limestone Polypody, Brittle Bladder Fern, Mountain Bladder Fern, Beech Fern, Alpine Fern, Oblong Woodsia.

3. *Ferns adapted for culture in close cases.*—True Maiden Hair, Alternate-leaved Spleenwort, Lanceolate Spleenwort, Sea Spleenwort, Wall Rue, Maiden Hair Spleenwort, Common Hart's Tongue, Brittle Bladder Fern, Mountain Bladder Fern, Filmy Fern, Wilson's Filmy Fern, Bristle Fern, Beech Fern, Oak Fern, Black Spleenwort.

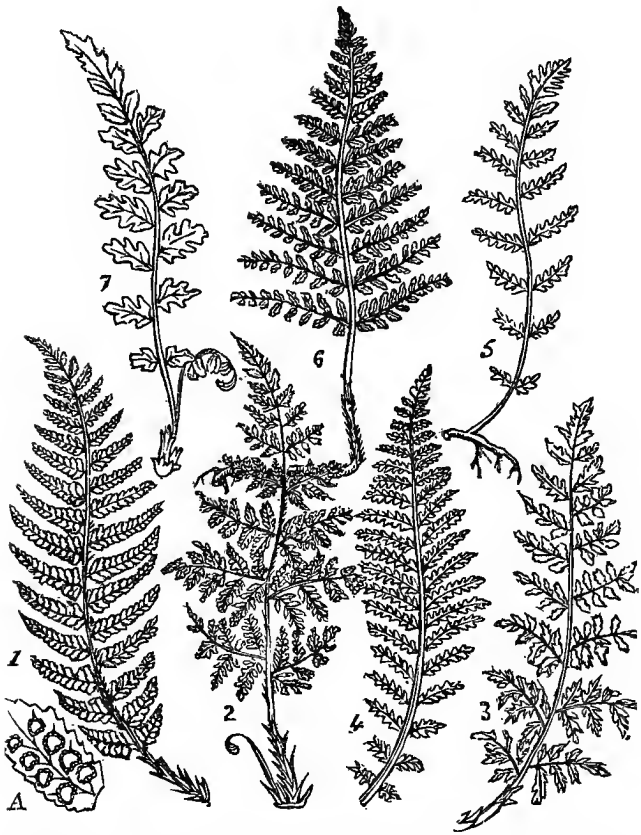


PLATE 6.—1, Male Shield Fern. A, Lobe of Pinnæ of do. 2, Spreading Shield Fern. 3, Broad Shield Fern. 4, Mountain Shield Fern. 5, Marsh Fern. 6, Rigid Shield Fern. 7, Crested Shield Fern.

In growing ferns in pots, the same attention is required with regard to the soil, watering, and drainage, as is necessary for ferns grown in the open air. For all kinds of ferns cultivated in this manner, soft and fibrous, black peat earth affords the best soil, which may be combined with loam, sand, a little finely-chopped dung, and, in some cases, some old mortar, as the

particular species to be potted may require. The pots should be filled up, to one third the height from the bottom, with pieces of broken tiles and small lumps of freestone, that the roots of their tenants may be well drained, and that the air may circulate freely through the soil. Like the plants in the open air, they should be refreshed with frequent watering from a pot fitted with a rose pierced with very fine holes. Watering should be continued without intermission, as often as twice a day in hot dry weather throughout the summer, and moss should be spread over the top of the soil in the pots round the bottom of the stems of the fronds, to keep the earth from drying too rapidly. In autumn, when the leaves of the deciduous and annual ferns begin to wither, the watering should be abandoned altogether. Delicate ferns that require a constant supply of moistnre in small quantities, should have a vessel suspended above them, with a hole in it, from which the water can fall drop by drop, on a tile so placed that the water can glance from it in tiny globules of spray over the thirsty fronds.

When the pot is prepared for the reception of the soil, a little should be thrown in on the first layer of broken tiles, and the rhizome placed on it; the stems of the fronds should then be held in one hand, and the pot filled to within an inch of the margin with soil, lightly thrown in and pressed very gently over and above the rhizome and roots, as the majority of ferns will be found growing in loose mould.

The third and last method of rearing ferns is in what is called a Wardian case. The mode of treatment, as far as the soil, drainage, and method of planting are concerned, is exactly the same as that which is adopted for ferns in the open air and in pots, and all that is required here is a short account of the general plan on which the cases may be constructed.

The simplest and nearest approach to a Wardian case, in the true acceptation of the term, is a large glass vessel or bottle, which may be tightly corked to exclude the air. It will be found that fern seed can be readily raised in such a vessel, or in a globular Florence oil-flask; but when the fronds fill the bottle, and are large enough to be transplanted, it must be broken. The cork should be removed now and then to admit the air, as the ferns will thrive much better than if it is entirely excluded.

Another form of Wardian case is a shallow glass pan, with a bell-glass fitting over it. Ferns will do well in this if a layer

of broken tiles be placed at the bottom of the pan, and care is taken to remove the glass shade, for a short time, about twice a week. But as the glass pan is impervious to water, and consequently any excess of moisture cannot escape from it, it will be found better to use an earthen pot instead of it, which will allow the soil about the roots of the plants to be thoroughly drained.

But the proper method of constructing a Wardian case for ferns is to have two boxes or cases, one of which fits within the other. The outer one should be water-tight, and provided with means for removing the water that accumulates in the bottom of it without removing the inner case. This may be done by means of a small tap, or, if the case be placed on an ornamental pedestal, by having a tube passing down it to convey the water into a receptacle placed under its base, which should be hollow, in order to cover it and conceal it from view. The inner case may be made of wood or zinc, but it must not be as deep as the outer one, so that a vacant space of an inch or two in depth may be left beneath it when it is fitted into the outer case. The bottom of the inner case must be perforated with holes, to insure proper drainage.

Now these cases may obviously be adapted to any form as long as the above principle of construction is adhered to; and a very elegant addition to the furniture and decorations of a hall or apartment may be obtained by the use of an ornamental vase instead of a wooden box. The whole must be covered with a glass case, which must be made to correspond with the shape of the box or vase that it covers, whether it be rectangular, polygonal, or circular. In making a square case, the length should be about twice as much as the breadth, and the height of the glass covering should be equal to the breadth of the case; the top may be flat or raised like the roof of a house, or with four sloping sides inclining and fitting to a small flat piece at the top; but whatever form may be adopted, the whole roof, or one of the component pieces, should be on hinges, that the air may be admitted at pleasure. The exercise of a little taste and ingenuity will enable many to construct one of very pretty appearance out of a plain deal box, ornamented with leather-work, with an inner case of zinc for the plants, and a simple glass covering that may be made by any glazier from pieces of glass fitted together in strips of lead, after the manner of the panes in casement windows.

Many methods will suggest themselves by which ferns may

be made a source of pleasure, amusement, and instruction. The elegant shape of their graceful fronds renders them useful and beautiful objects for pencil and water-colour drawings, for photographic pictures, and for the adornment of tables, vases, flower-stands, and other pieces of ornamental furniture with leather-work in imitation of carved oak. The fronds may also be pressed and dried, and then fastened to sheets of cartridge paper bound together to form a Fern Album. Some sheets of stout blotting-paper and pasteboard, two or three flat boards, and a heavy weight or two, will furnish all that is necessary to constitute the press, in which the fronds should remain for two or three weeks at least. When dry, they should be fastened to the pages with little strips of paper gummed transversely across the stems, and the order, botanical name, English name, and the spot and date, when and where it was gathered, should be carefully registered in any convenient corner in this manner :—

ORDER	*Osmundaceæ.*
BOT. NAME	*Osmunda Regalis.*
COM. NAME	*Royal Fern.*
WHERE GATHERED . .	*Killarney, Ireland.*
DATE	*August 29th*, 1862.

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